

ppliance Outlook Brightens



Ceramic Tools Work





A PENTON PUBLICATION

Page 81 . . .

Metalworkers Plan To Expand Their Capacity 2.6% in 1959

Page 85 . . .

Memphis Reversal Spurs Pipe

Page 93 . . .

Why Scrap Sellers Seek U.S. Aid

Page 133 . . .

Machine Service Unit Gets Rid of Costly Production Downtime

Page 150 . . .

Loose Abrasives Give Fast Finish

Page 179 . . .

Structural Aluminum Begins Move

CONTENTS - PAGE 5



When an old machine costs you more than it earn replacement pays for itself!

There comes a time in the life of any machine, when it will no longer produce at a profit — a time beyond which its continued use represents a financial loss to your company. This point of obsolescence may be the result of physical aging or of technological advances. In either case, the result is the same — money wasted that could be saved by the investment in a new machine.

Determining when to rechine is too important for grule-of-thumb computations cise methods of comparatives is will give you the right sales engineers are well examaking obsolescence studies glad to do the same for studies have pointed the wayy portant savings.

For Example: A manufacturer of aircraft instruments had been using a 5-year-old precision lathe to perform boring, turning and facing operations on instrument cases. But when this was replaced with a new Heald Model 0 Unit-Type Bore-Matic like that shown at the right, operating costs for the same production were immediately reduced by over 78%. In addition, the elimination of a separate burring operation and reduced assembly time made further important savings, as indicated by the cost analysis below.

Old	Machine	New Machine
Parts per hour	4.3	20
Parts per year (Reg'd. Prod.)	10,000	10,000
Direct and Indirect Labor, per year		\$ 6,055
Scrap Losses, per year	\$ 500	\$ 300
Annual Maintenance Cost	\$ 600	\$ 300
Annual Operating Cost	\$21,449	\$ 6,655
Basic Annual Saving, New Machine		\$14,794
Additional Saving from elimination	n of	
separate operation		\$ 500
Additional Saving from reduced as	sembly tim	e \$ 1,500
Total Saving Per Year		\$16,794
Return on Investment for New Ma	chine	84%



YOU pay for obsolescence. Replacement pays for itself!

THE HEALD MACHINE COMPANY

Subsidiary of The Cincinnati Milling Machine Co.

Worcester 6, Massachusetts

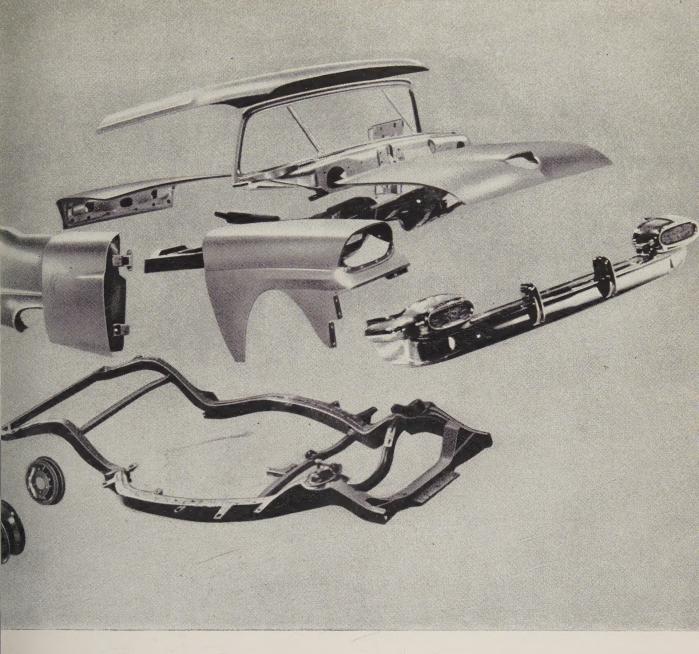
Chicago •

Cleveland

Dayton

Indianapolis

. .



Your car is about 70 pct sheet steel

The biggest safety feature of today's automobile is the rugged strength of the sheet steel in its frame and body. Yet rigid and tough as sheet steel is, it is also amazingly plastic. Between the dies of a press it literally flows. Fenders, bumpers, decks conform precisely to the designer's dream. One giant punch, and a rugged, one-piece roof panel emerges, ready for the assembly line.

Thousands of tons of Bethlehem hot-rolled and cold-rolled steel sheets go into parts, components

and sub-assemblies of American automobiles. Bethlehem sheets are as uniform and as finely made as any on the market.

If you work with sheets, perhaps we can help you turn a problem into a profit. For prices and deliveries, just get in touch with the nearest Bethlehem office.

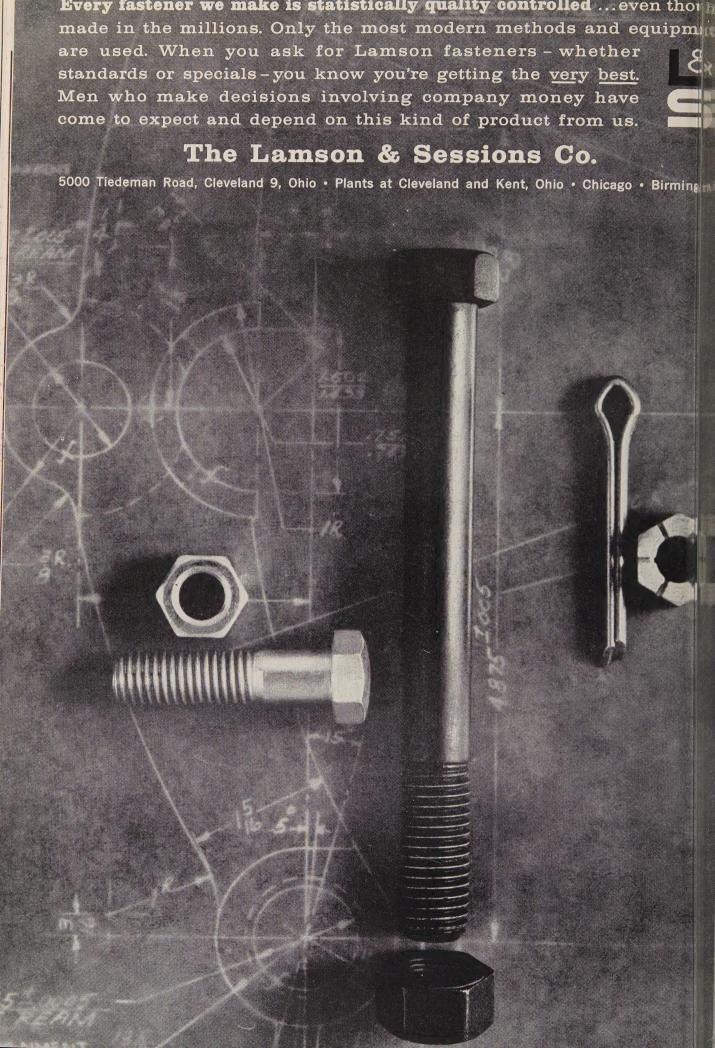
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel

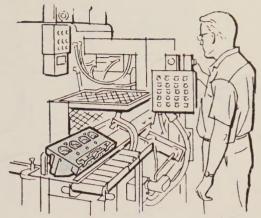
Corporation. Export Distributor: Bethlehem Steel Export Corporation.

BETHLEHEM STEEL

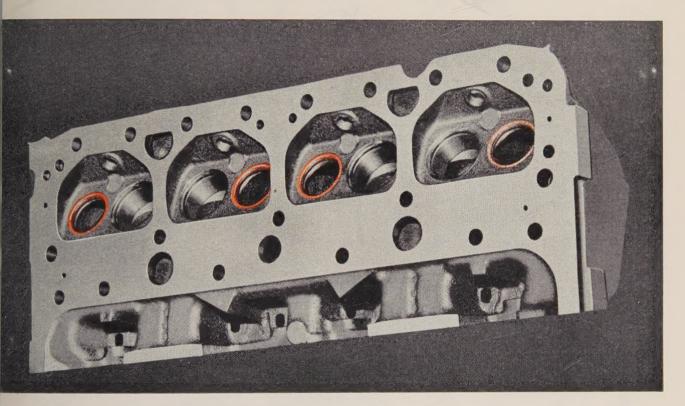




FOCCO* Hardening of Exhaust Valve Seats



Saves Cost of Expensive Alloy Inserts



• In just 12.5 seconds the four valve seats on this heavy-duty truck cylinder head are heated to 1650°F. An area of 32″ perpendicular to the valve seat is hardened to a minimum of 42 Rockwell C. TOCCO's uniform, localized hardening permits the elimination of costly alloy inserts. The cost of induction hardening is a small fraction of the cost of these alloy inserts.

This unusual application indicates the wide scope of cost-saving possibilities available through the educated use of TOCCO Induction Heating. If your products require hardening, heating for forming or brazing, it's better than an even bet that TOCCO Engineers can save you money.



THE OHIO CRANKSHAFT COMPANY

	Today — NEW F Dept. S-12, Clevelo	
	sults of TOCCO Induction	
Name		
14dille		
Position		
Position		

ecember 15, 1958

THE PRODUCTIVEST LATHES IN EVERY CLASS YOU'LL FIND

THE SOLUTION OF THE PARTY OF TH

L‡BLOND

This is the LeBlond 55 heavy duty lathe. Powerigidity, stamina. Even thing you need to get man mum metal removal wire complete dependability. a large lathe or small this the real measure of pro-

ductivity. Write for you LeBlond Complete Lin Catalog No. C-58.

THE R. K. LEBLON MACHINE TOOL C. CINCINNATI 8, OH

World's Largest Builder of A Complete Line of Lathes for More Than 71 Year

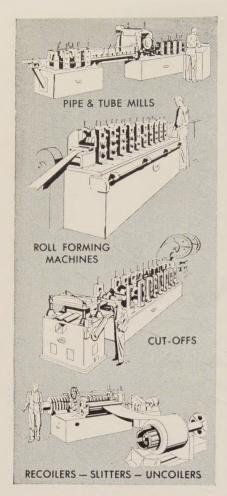
This Week in

Fine TEEL
Metalworking Weekly

December 15, 1958 Vol. 143 No. 24

EDITORIAL 79 B	usiness –	METALWORKING OUTLOOK	73
Top brass should get out into the field to cultivate top-level contacts, gather first-hand facts.		sity 2.6 Per Cent in 1959	83
SPECIAL FEATURE 83	Economists Optimistic at U.	S. Chamber Forecasting Session Memphis Case Spurs Line Pipe	84 85
	Here's a Way To Measure D Executive Pay Static; Salaries	Executive Ability—GE's approach Up, but Bonuses Down	88
		Reserve with School Loan Program by Ohio Legislature	88
第 注 一		Guaranteed Annual Wage"	93
		as Free Trade Blossoms	96
		strength in steel and autos	97
Major appliance makers look for a 5 to 0 per cent increase in sales during 1959, ompared with 1958's. Some companies	More Companies Try Leasing	:—Six advantages cited in survey	113
	roduction —	TECHNICAL OUTLOOK	127
	You Can Make Ceramic Tool	s Pay Off—Research finds aids	128
VINDOWS OF WASHINGTON 90	Aluminum Screws Cut Costs	-Better for aluminum products	131
Rep. Wright Patman has again	Machine Service Unit Gets R	id of Costly Downtime	132
brought his quarrel with the Small Business Administration into the open.		Ou Pont develops new insulation	134
		single diamond does the job	134
AIRRORS OF MOTORDOM 99		Links Rolling Mills	136
Cars produced overseas by Ford and GM are beginning to make a dent		Castings—Has several advantages	140
in import field.	•	-It likes new welding units	143
		opper Billets and Slabs	140
HE BUSINESS TREND 103		liation shields hold heat	149
Steel's industrial production index reaches highest point in nearly a year and a half.	Quick Finishing at Low Cost-	—A roundup on equipment	130
N	Narkets –	MARKET OUTLOOK	177
VHERE TO FIND—	Idikeis –	MARKET	
ehind the Scenes 6	Complete Index to Market No	ews and Prices	17
etters to the Editors 10 'ditorial & Business Staffs 16	Structural Aluminum Begins	Го Move—Potential is great	179
Lalendar of Meetings 23	Steelworks Operation Chart a	nd District Ingot Rates	186
Ien of Industry 107	Steel Shipments for October L	argest Since Year Ago	186
Iew Products 153 Iew Literature 172	Scrap Index Drops Another 50	Cents	198
Iew Literature 172 dvertising Index 206	Nonferrous Metals—Lid Put	on Aluminum Prices	202

STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, \$10 a year; all other countries, \$20 a year; single copies, 50 cents. Metalworking Yearbook issue, \$2. Published every Monday and copyright 1958 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.



YODER MAKES THEM ALL

... Complete equipment lines for heavy or light production!

Uncoilers, slitters, roll-forming machines, cut-offs, pipe and tube mills, special machinery for ferrous or non-ferrous metals are all made and engineered by Yoder to fit your specific requirements.

Special attachments and auxiliary units can perform additional operations such as welding, coiling, punching or embossing without extra labor cost while increasing production speed.

Let Yoder engineering and "knowhow" help you get the most from your plant... with Yoder equipment. For full details, write to:

THE YODER COMPANY
5502 Walworth Ave. • Cleveland 2, Ohio



behind the scenes



The Loaded Question

This morning we were reminded of the fable about the benevolent and sagacious king who yearned to improve his government. Aware that his ministers were too cagey to tell the truth, he summoned his jester. "Good varlet," quoth he, radiating the soft and innocent sheen associated with a tub of butter, "pray tell me exactly what you think of me." The court fool did a double take, then registered alarm. "Your majesty, if I speak frankly, you'll throw me to the royal wolves, so please excuse me. Perhaps her majesty, the queen . . ."

"Tut, tut and tut!" exclaimed the genial and enlightened monarch. "Feel perfectly free to speak your mind. This is self-improvement week, you know, and I'd like to have your honest opinion. Come, now; what do you really think of me?"

"Your majesty," said the fool, "you

simply stink!'

"Throw this idiot to the wolves!" the king screamed. So the wolves gobbled up the poor jester, and a new moral spread throughout the kingdom: Be sure you're right, and then be sure to keep your trap shut.

Nothing but the Truth

Now, the editors of STEEL yearn after improvement, too. Sometimes they ask readers for opinions. On the morning the king came to mind, the editors had invited an average reader to attend a meeting. "Good sir," said the chairman, "we would like to have your honest opinion. Please tell us what you really think of STEEL."

The reader, James Bateman, president of Spiral Brushes Inc., Cleveland, producer of industrial brushes, did a double take, then registered mild concern. "You mean, you want me to tell you exactly what I think? Well, I confess I miss some copies entirely." Everybody grinned and relaxed; here was an honest critic.

Penetrating questions and sensible answers flashed back and forth over a period of an hour, and Editorial Assistant Jane Wedge, who was delegated to make a shorthand report of the meeting, almost ran out of note paper. Some of the questions drew unexpected answers. Mr. Bateman was asked if he favored the practice of permitting employees to read business publications on company time. "In my opinion," he chuckled, "the only reading material that might tempt some employees is comic books." He did say, however, that he frequently directed the attention of certain supervisory personnel to specific articles in STEEL.

Machine Tool Editor Robert Huber wanted to know what Mr. Bateman liked best in the magazine. "I mean, do you like news, or technical stuff, or prices? do you read first?"

The Average Reader reacted peri"I just flip through the magazines
this, and when something rings as
I stop and read."

Somebody wanted to learn what the bells ring. "Two things," saids Bateman. "First, is it an application we can use in our company? Second an application that can be used company that uses our products? You I'm a selfish reader."

Market Editor Bill Rooney wonders Mr. Bateman spent much time imback of the magazine, deep in the columns. Steel's price pages are a stard in the metalworking industry; you find in these dozens of digits the print almost anything in the business, shovel turnings to tight cooperage his "Never get back there," said Mr. Battarblandly. "The only prices that interesses are brush prices."

From prices we switched to Chinese bristles because somebody mentioned eign competition, and this is as good time as any to talk about Chinese bristles. Sort of varies the routine, do "The finest paint brushes inr world," explained Mr. Bateman, "are from Chinese pig bristles. Naturally, come from China, but we don't reco Communist China, so we can't get bristles any more. However, Eng recognizes Communist China; the Er get all the bristles they want, and make pig bristle brushes and sell over here cheaper than we could them, even if we had the Chinese bristles, which we don't."

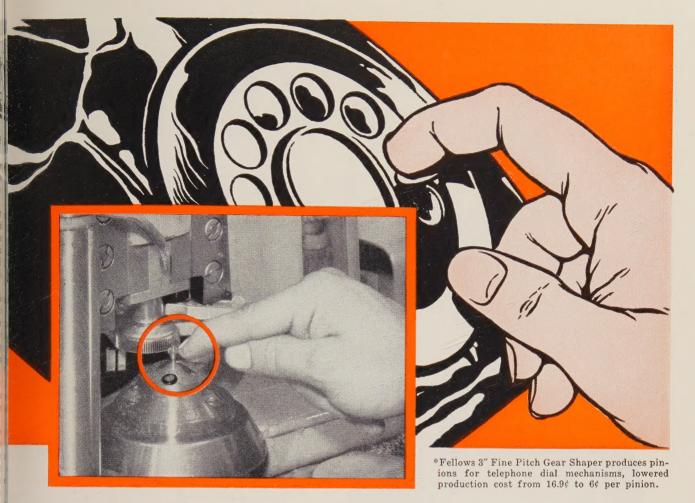
Brushes up on Vital Stuff

About 390 companies make indular brushes, which Mr. Bateman define "power driven bristly tools that depolish, clean, or shape products." He up his company since the war, and the reads Steel, he seeks nothing but tinent information.

"Speaking for myself," he concluder read only items and ads that refer in way to industrial brushes, or to the provement of our business. I like Program for Management series, the ies and reports on depreciation, and thing on new products. Your new coare good, too, and I think you have a fine job with the four-page Metalwing Outlook."

You might say that we asked Mr. I man to step up and deliver his 2 coworth, but darned if it didn't turn to be \$2 worth, instead!

Shrdle



GEARED to put the world at your finger tips!

A movement of your finger brings the whole country within reach of your telephone... thanks to the automatic dial system! For only dependable dial switching can handle tens of millions of calls daily, leave operators free for long distance and other non-routine services.

Tiny gears produced on Fellows Gear Shapers are important to the smooth, dependable service of many of America's dial phones, providing trouble-free performance year after year, decade after decade. These pinions must be of high

quality, yet production cost must be low. For telephones, as for many other products, the requirements for accuracy and low cost in gears are met by Fellows Gear Production Equipment.*

Your own gear production needs, from 1/16" to 120" pitch diameter, can probably be met more profitably and efficiently with Fellows equipment. Why not get full information? Just write, wire or phone any Fellows office.

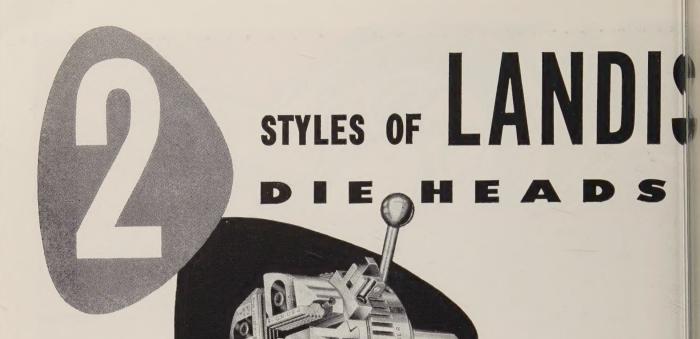
THE FELLOWS GEAR SHAPER COMPANY 78 River Street, Springfield, Vermont Branch Offices:

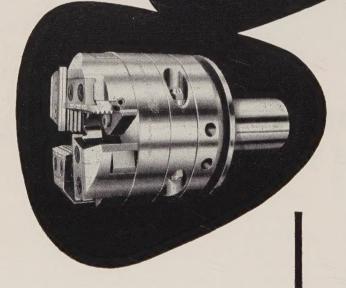
1048 North Woodward Ave., Royal Oak, Mich. 150 West Pleasant Ave., Maywood, N. J. 5835 West North Avenue, Chicago 39 6214 West Manchester Ave., Los Angeles 45

THE PRECISION LINE

Fellows

Gear Production Equipment





LANDIS *Machine* COMPANY

W A Y N E S B O R O P E N N S Y L V A N I A maximum PRECISION or ECONOM

"Threading Efficiency" requires the selection of proper die head for the job to be done, and is essence of LANDIS design. To ensure that you use the most efficient threading tool, LANDIS materials and the selection of proper die heads in two basic styles:

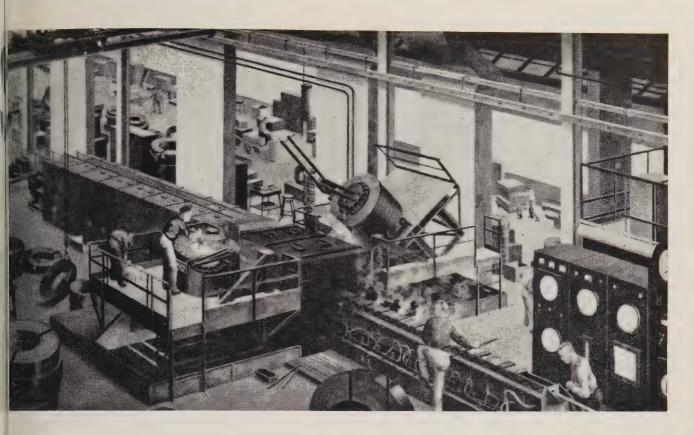
HARDENED-AND-GROUND HEADS should be where a high degree of thread-cutting accuracy required. Their fundamental design and the inher qualities of specially selected and hardened mater provide the maximum rigidity necessary for thread to Class 4 and Class 7 tolerances.

HEAT-TREATED HEADS are designed for the utmeconomy when doing commercial threading, and produce threads to Class 2 and 3 fits. The initial cois small and rugged construction ensures trouble-flooperation and few repairs. Wide range covera requires minimum tool inventories, and along with use of LANDIS Tangential Chasers allows maximum output per dollar of tool cost.

LANDIS Tangential Chasers are an important face both in the economy and precision of these bahead styles. These chasers may be replaced or ground singly, can be used for 80% of their origin length, and allow either style of die head to produthreads of the accuracy for which it is recommended.

LANDIS manufactures more than 100 sizes and type of standard and special Die Heads for use on three ing machines, turret lathes, tapping machines and be automatics. Let us suggest the Head most suital for your needs—send specifications and ask Bulletins F-80 and F-90.

8



50 CYCLE INDUCTION MELTING

OF HIGH LEADED BRONZES

25 years ago, THE CLEVELAND GRAPHITE BRONZE OMPANY, division of CLEVITE CORPORATION, piosered 60 CYCLE INDUCTION MELTING of bronzes with to 10 35% lead. Special furnaces developed by AJAX for this difficult job are an important element in their nique continuous production line for steel-backed ronze bearing strip. 60 CYCLE INDUCTION MELTING furnaces resulted in substantial improvements and cost avings over gas-fired units used earlier for that purses. Today, CLEVITE operates six continuous lines in pis country and abroad with AJAX 60 CYCLE INDUCTION MELTING furnaces, producing enough strip to take 130 million bearings and bushings per year.

The heavy duty 60 cycle inductor developed by AJAX and pioneered by CLEVITE will attain a lining life of one year with bronzes of substantial lead content. Electromagnetic stirring assures uniform alloy and close temperature control. Compared to externally fired equipment, metal loss savings run into many thousands of dollars per year. Recently, several large producers of leaded bronze castings converted their foundries entirely to 60 CYCLE INDUCTION MELTING.

While this is one of the most difficult metals to handle, the advantages of 60 CYCLE INDUCTION MELTING stand out today wherever copper alloys are melted. As specialists in 60 CYCLE INDUCTION MELTING, we have developed furnace types to best fill each application.



ENGINEERING CORPORATION

TRENTON 7, NEW JERSEY

60 CYCLE INDUCTION MELTING

Associated Companies:

Ajax Electrothermic Corporation

Ajax Electric Company

This new H-25 PAYLOADER°



replaced two tractor-shovels

Lawrence Parker, Supt. of Rollstone Foundry, Inc., Fitchburg, Mass., says, "We recently replaced two other loaders with the new H-25 'PAYLOADER'. It has cut our overall work period in the night crew operation from 11 hours to 6 hours without changing floor working conditions. Its short turning radius enables it to work in close areas not possible with the two other units. Engine power is geared for operating conditions better than any other loader previously worked or demonstrated in our plant."

16 hours a day

Specializing in gray iron, steel and stainless castings, Rollstone keeps the Model H-25 busy 16 hours a day throughout the foundry. It moves castings, unloads new sand, handles coke, cleans sand from the floor, feeds the sand cutter and molding stations, removes refuse.

Maximum carry capacity

The Model H-25 with a carry capacity of 2,500 lbs. can carry more load for its weight than any tractor-shovel near its size.

Fast, easy operation

The only machine in its class with power-shift transmission having two speeds forward and reverse, power-steer for fast, easy operation.

Reliable traction

The only machine in its size range with "no-spin" differential to maintain traction.

Fully protected

In order to insure long life and low maintenance, full protection is provided by triple air cleaner, three cartridge-type oil filters and oil and grease seals on all vital points.

The outstanding capacity, speed and protected construction of the new Model H-25 will help you keep competitive too. Your Hough Distributor will supply full information on "PAYLOADER" models.

HOUGH



TRE FRANK G. HOUGH CO. 876 Sunnyside Ave., Libertyville, III. Send data on Model H-25 On larger units	Company			
	Title			
	Street			
Name	City	State		

LETTER!

Sheldon's Headache Helps



May I have a copy of "The Revolution Schmaltz" (Nov. 24, p. There is a lot of negative philosophryou will excuse the term, in the ten it at the end of the article.

Thank you, and may we have n reminders of the value of advertising

Francis I.

Chief Draftsman Titanium Metals Corp. of America Toronto, Ohio

We wish to compliment you on the article. Please send a reprint to advertising manager.

H. S.

Manager of Sales Tennessee Coal & Iron Div. U. S. Steel Corp. Tulsa, Okla.

Your article was a good one. We we appreciate receiving as many extra corof it as possible.

G. K. Iwasa

Manager—Advance Planning Metals Processing Div. Curtiss-Wright Corp. Buffalo

Reciprocity: Not So Good

I have read "Reciprocity Can Be Got (Nov. 17, p. 55).

Recently, one of the large steel mag facturers did not invite a distributor ours to quote prices on equipment cause it claimed we did not use its pu uct while some of our competitors did

Inasmuch as small manufacturers unable to buy in carload lots and depton local sources of supply, it is a lihard for me to understand how this scompany could possibly know we did use its product. We buy steel from local distributors who are in a position deliver what we want when we wit. It is immaterial to us where it confrom.

If reciprocity is a good thing, why extend it to stockholders as well as c tomers. Instruct purchasing agents to I from manufacturers whose officers h stock in their companies rather the

(Please turn to Page 12)



"We've cut stainless costs with ferromanganese-silicon"

Perromanganese-silicon allows savings of as much as 8 per ton, depending upon practice, in the production of high-manganese stainless steels. It also reduces manganese costs for the chromium-nickel grades of stainless.

The alloy is both an efficient slag reducing agent and the lowest-priced source of low-carbon manganese currently available.

Tor details on cost reductions in your practice, contact your like the contact representative.

ELECTRO METALLURGICAL COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N.Y.

Ferromanganesesilicon gives lower costs, rapid solubility, and high manganese recoveries.



Electromet
FERRO-ALLOYS AND METALS

UNION



LETTERS

(Concluded from Page 10)

buying from manufacturers whose tives have no stock interest.

I feel this matter of reciprocity doverdone and yet, I might agree that is some merit in it where a small facturer like ourself has used a presclusively for 30 or 35 years.

It is an interesting discussion.

B. C. Saus Secretary & Sales Manager Gallmeyer & Livingston Co. Grand Rapids, Mich.

Planning Needed for New Bay

I not only read "Get Ready fco New Boom" (Nov. 17, p. 97) but Inforwarded it to all of our top make ment team here at Parker-Kalon.

You have done a wonderful job bringing the gross potential in income to executives' attention. I agree with that of greatest importance is the plant and organization which must go preparations for such growth.

W. T. Ylv

President Parker-Kalon Div. General American Transportation Coc Clifton, N. J.

I read your article with much into You have done an excellent job of a pointing the approaches which have used by a number of companies.

Louis S. I

Manager Economic Research Calumet & Hecla Inc. Chicago

This final report in the 1958 Man ment Series is one of the best in an cellent series.

E. Byw Manager Marketing Div. Manning, Maywell & Moore Inc. Muskegon, Mich.

Shorter Sermons Perhaps?

I would greatly appreciate a reprint "Memo to Busy Executives—How To Time" (Nov. 10, p. 86).

Vance L. Ecks

Pastor
Prince of Peace Lutheran Church
La Mirada, Calif.

Praises Russian Articles

I would like to compliment you, the fine editorials and articles written Russia. "Russia's Biggest Weapon?" (I 24, p. 55) is a good example. You can a great deal to continue to alert our per to the present and coming struggle Communism. Thanks again.

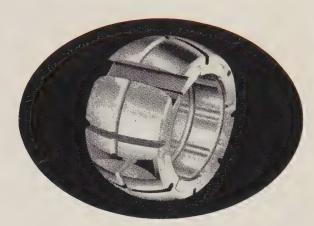
Dennis J. Can

Division Superintendent Steel Producing U. S. Steel Corp. Duquesne, Pa.

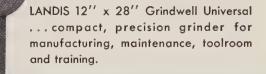
.ow cost general purpose grinder with 2 exclusive "big grinder" features...



Variable speed headstock... compact design with only two revolving parts. Can be swiveled for angle or face grinding.



Microsphere bearings...close running clearance of Landis Microsphere spindle bearings gives faster spark-out, accurate, quick response to wheel feed.



LANDIS

precision grinders
LANDIS TOOL COMPANY / WAYNESBORO, PENNA.

New Materials Handling Ideas from Republic

SAVE SPACE, CUT COSTS, IMPROVE INVENTORY CONTROL



THESE REPUBLIC BOX AND SKID UNITS PERFORM FOUR JOBS, CUT HANDLING COSTS 10%. They were designed and fabricated by Republic's Pressed Steel Division for Dresser Industries' new pipe couplings and fittings plant at Wellsboro, Pennsylvania.

The multi-purpose units provide for: (1) Delivery of semi-finished parts to production stations for final machining. (2) Feeding of parts to machines in combination with hoppers built by Dresser's Ideco Division. (3) Receiving finished parts as they come off the machining line. (4) Storage of finished parts until ready for shipment.

Plant management estimates a saving of 10% in han-

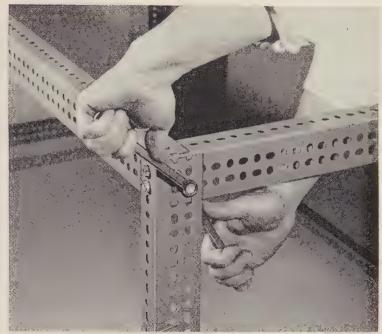
dling costs since the Republic Box and Skid Ul were placed in service. Also, it is possible to main an accurate inventory of both finished and semi-finish parts and to reduce storage space requirements.

Future savings in maintenance costs should be rized because corrugated-steel construction of the boand skids provides strength, assures long service at lowest per-year-cost.

Now is the time to talk over your handling or stage problems with a Republic Engineer. A special designed or a standard unit could cut your costs simplify an operation. No obligation. Just comyour Republic Materials Handling Representative. mail the attached coupon.



ONTINUOUS MATERIAL FLOW to machines is a time and ost saving feature of Republic Box and Skid Units used in ombination with Dresser-designed hoppers. Specially deigned opening in front of box hooks and locks on hopper. ift truck operator trips dumping mechanism with truck orks. Idle machine time is eliminated.



NEW SLOTTED CONSTRUCTION ANGLE MEETS ALL FRAMING NEEDS. That's Republic METAL LUMBER®, designed and engineered by Republic's Berger Division. It's versatile, durable, unlimited in application. Plan your assembly, cut Republic METAL LUMBER, join with bolts. Longitudinal and transverse slots on ¾-inch centers make adjustment easy. Bonderized and finished with baked enamel. Ten angles per bundle, light or heavy gage, 10- or 12-foot lengths, with hardware. Bundle stores in same space as one $2^{\prime\prime}$ x $4^{\prime\prime}$ piece of lumber. Send coupon for catalog loaded with ideas.



NEW "BUDGET BUILDINGS" by Republic's Truscon Division brings the cost of additional storage space down low. It's a quality steel building with a tight, dense, galvanized coating that's more rustresisting than ever. Simplified design permits fast on-site erection. No painting needed. Your "Budget Building" order will be handled fast from offthe-shelf stocks. Immediate delivery in widths of 32, 36, 44, and 48 feet . . . 12- and 14-foot heights. Lengths as long as you want them. Send coupon for complete details.

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION DEPT. ST -5086A

1441 REPUBLIC BUILDING . CLEVELAND 1, OHIO

- ☐ Have a Materials Handling Engineer call.
- Send more information on:
- ☐ Materials Handling Equipment
- Truscon 'Budget Buildings'
- ☐ Republic METAL LUMBER

Name...

Company_

Address_ City___ Zone___State_



NIAGARA SECTIONAL Aero HEAT EXCHANGER

gives close temperature control, saves you

LABOR, Power, Water

 You gain in accurate control of quench bath temperatures and quickly effective capacity to handle initial peak load of heat in quenching. You prevent production set-backs, increase the output of your heat treating department, prevent oil fires, save losses from rejected parts.

Niagara Aero Heat Exchangers give you this control in both furnace and induction hardening methods. They prevent both over-heating and over-cooling of the quench bath. Hundreds of heat treaters know they prevent many troubles, constantly improve quality and increase production.

They quickly pay for themselves by saving cooling water coils and extend your quench capacity without extra water or cooling tower.

Use Niagara Aero Heat Exchangers also to cool and control temperature of furnace jackets, induction heaters, welders, wire drawing and extrusion dies, rolls, transformers, engines and all plant water cooling systems.

Write for Bulletins 120 and 132 giving complete information.

NIAGARA BLOWER COMPANY

Dept. S-12, 405 Lexington Ave. NEW YORK 17, N. Y.

District Engineers in Principal Cities of U.S. and Canada



Editor-in-Chief, IRWIN H. SUCH Editor, WALTER J. CAMPBELL

Associate Managing Editors, VANCE BELL, JOHN S. MORGAN

WILLIAM M. ROONEYMarke	t Editor
ROBERT F. HUBER Machine Too	l Editor
HARRY CHANDLERCop	y Eaitor
GLENN W. DIETRICHAssociate Cop	y Editor
FRANK R. BRIGGSAssociat	e Editor
ROBERT O. JAYNESAssociat	e Editor
ROBERT M. LOVEAssociat	e Editor
AUSTIN E. BRANTAssociat	e Editor
ROSS WHITEHEADAssociat	e Editor

GEORGE J. HOWICKAssistant	Edito
DERRY EYNON	Edite
NEIL C. ROBERTSAssistant	Edita
${\tt DONALD} \ \ {\tt E.} \ \ {\tt HAMMERSTROMAssistant}$	Edito
${\sf JOHN\ TERESKO\Assistant}$	Edito
$\textit{MARY T. BORGERHOFF} \ \dots Assistant$	Edita
MARY ALICE EARLYAssistant	Edita
ELLEEN CORTESAssistant	Edito
MARY ANN STUVEEditorial As	sistan

JANE WEDGE, Editorial Assistant THOMAS H. BRYAN, TOM WELSH, Art Editors IRENE KASNER, Editorial Service

Resident Editors

Chicago 11520 N. Michigan Ave. ERLE F. ROSS, WILLIAM E. DEAN Whitehall 4-1234

Pittsburgh 192837 Koppers B WILLIAM V. WALLACE—Atlantic 1-3211

15800 W. McNichols Rd Detroit 35 A. DONALD POSTMA—Broadway 3-8150

Washington 41123 National Press Bldg JOHN R. BOTZUM—Executive 3-6849

Editorial Correspondents

Buftalo-Emerson 5385GEORGE E. TOLES Youngstown-Riverside 7-1471..GEO. R. REISS Cincinnati-Beechmont 1-9607...DICK HAVLIN Birmingham-Birmingham 3-1121 R. W. KINCEY St. Louis—Garfield 1-1212. HAMILTON THORNTON Houston-Mission 9-0515ROBERT SHIRK Los Angeles-Webster 5-1234..NORMAN LYNN San Francisco-Yukon 6-5151 EDWIN HAVERTY Seattle-Melrose 2-1895R. C. HILL Toronto, Canada-Empire 4-9655..F. S. TOBINI Birmingham, EnglandJ. A. HORTON Paris, FranceLEON JAUDOIN-PROM Brussels, BelgiumPAUL DE KEYSER Dusseldorf, GermanyDR. HERBERT GROSS

BUSINESS STAFF

Business Manager, D. C. KIEFER

Asst. Business Mgr....C. A. TALLINGER JR. Advertising Service Mgr. ... DORIS MITCHELL Production ManagerA. V. ANDERSON Classified AdvertisingEVELYN DIETZ

Market Research Mgr. T. M. BALLANTINE Circulation DirectorJ. C. GERNHARD Distribution ManagerG. R. EBERSOLE

Reprints, JUNE SCHILENS

Advertising Representatives

Wynnewood, Pa. (Phila.) 200 Wynnewood Ave. WM. J. VERSCHOOR—Midway 2-6512 Farmington, Conn.12 Farmstead Lane CALVIN FISHER JR. Orchard 7-1756

E. Rochester, N. Y.217 Ridgeview Dr. HAROLD A. DENNIS—Ludlow 6-6988 Pittsburgh 192837 Koppers Bldg. J. C. SULLIVAN—Atlantic 1-3211

Cleveland 13Penton Bldg. J. K. GILLAM, N. W. MANNING—Main 1-8260 Cincinnati 62215 Victory Parkway
E. L. FRANKE—Parkway 1-0711

Detroit 3515800 W. McNichols Rd.
C. A. TALLINGER JR., D. C. HYDE
Broadway 3-8150
Chicago 11520 N. Michigan Ave.
L. C. PELOTT, W. L. POLAND
WM. J. D'ALEXANDER, RICHARD BIRDSONG
Whitehall 4-1234

Los Angeles 365943 W. Colgate Ave F. J. FULLER—Webster 1-6865





Published Every Monday by

THE PENTON PUBLISHING CO., Penton Bldg., Cleveland 13, Ohio

MAin 1-8260

GEORGE	0.	HAYS							. Chairman
RUSSELI	_ C	. JAEN	KE						. President
FRANK	G.	STEINE	BACH		Vice	Pres	ident	and	Secretary
FRANK	0.	RICE					'	Vice	President
JOSEPH	Ρ.	LIPKA		Tre	easurer	and	Assis	stant	Secretary

Also Publisher of FOUNDRY, MACHINE DESIGN, NEW EQUIPMENT DIGEST, AUTOMATION Member of Business Publications Audit of Circulation Inc., Society of Business Magazine Editors, and National Business Publications Inc.

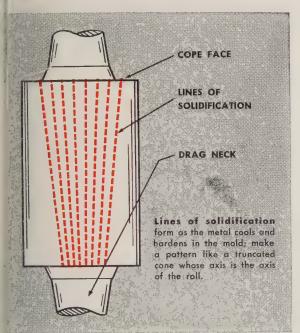


TIPS FROM A ROLL MAKER'S NOTEBOOK

ACKINTOSH-HEMPHILL DIVISION, E. W. BLISS COMPANY, PILLSBURGH J. PRINSYIVANIA

last mill rolls . Johnston cinder pots . rotary tube straighteners . end-thrust bearings . heavy-duty lathes . steel and special alloy castings

What we learn from "fingerprinting" a back-up roll



"Cope face spot depth" sounds a little mysterious, but actually it is a relatively simple, accurate guide to the future performance of back-up rolls in 4-high mills. Even more important, when the roll maker keeps sulfur print records of the spot depth on every back-up roll he ships, it is possible to relate the pattern of the print to the actual tonnage turned out by the roll, as reported by the customer. With this information at hand, Mack-Hemp metallurgists can modify the alloy "mix" or the foundry practice so that the next set of back-up rolls will give even better service.

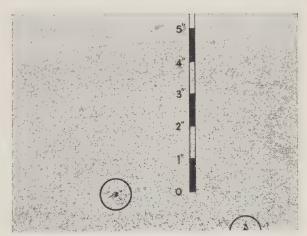
What "cope face spot depth" reveals—As a freshly-poured Mack-Hemp "Technalloy" or "Midland Superalloy" steel back-up roll cools and hardens, so-called "lines of solidification" form below the surface of the roll (see diagram). These lines arrange themselves in a cone-shaped pattern spreading outward as they ascend from the "drag" wabbler toward the upper shoulder of the roll body, or "cope face." The points where the lines of solidification end in the cope face

can be detected by an acid etch, and a permanent record made by laying special photographic paper over the etched area.

As you can see, the depth of this zone of dense metal is shallowest at the cope face because of the way the lines angle outward. Hence, cope face spot depth provides a measure of the minimum amount of sound, homogeneous metal between these lines of solidification and the work surface of the roll.

Spots should be deep—In general, the roll maker's objective is to keep the spots on the cope face as deep as possible below the worn-out circumference of the roll. However, sheer depth is not the only indication of the roll's life expectancy and behavior in service. The arrangement and density of the spots also tell their story to the trained metallurgist, particularly when he studies them in the light of performance data from the customer and foundry practice at Mack-Hemp.

You can see why it's a good idea to keep careful records of tonnages rolled by your Mack-Hemp hot and cold mill back-up rolls. It's a good idea, too, to consult Mack-Hemp on any and all your problems of roll use and selection whenever they arise. Feel free to call or write us at any time.



Sulfur print of "Superalloy" back-up roll. Two spots are clearly evident at the bottom of the print ($\frac{1}{3}$ actual size).

MACKINTOSH-HEMPHILL

You get more tonnage from the rolls with the Striped Red Wabblers

Division of E. W. BLISS COMPANY

Presses, Rolling Mills, Special Machinery





timbre tester

Steels, like men, have different personalities. Years ago this mysterious something in steel was referred to as "body", "nature", or "character" . . . until 1930, when *Carpenter* researchers, borrowing a term from music, called it *timbre*.

Today, *timbre* is the common term steel men use when they refer to the still-mysterious but now-controllable property of tool steels, that determines grain size and toughness.

It was only natural that *Carpenter's* designation received immediate and general acceptance. For by that period in 1930, *Carpenter* was firmly established as a pioneer in the research and development of *fine quality steels*.

For many years, demands by American industry for *Carpenter*-quality stainless, tool and alloy steels often exceeded our ability to produce. Like that of all custom-craftsmen, our objective was *quality*, the pioneering of new and better steels, rather than *quantity*.

Within the past year, we have doubled our ingot tonnage capacity. Today, as the result of long-planned expansions, we can offer quantity along with famous Carpenter quality. For the first time, both are now available. And both will continue to be available . . . even in times of peak demand.

While *quality* will continue to remain a sacred *Carpenter* watchword, we are determined to lead the way and grow apace of the ever-increasing demands of industry for the world's finest steels.

Carpenter will continue to meet the timbre test.



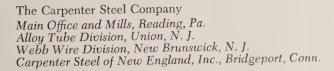
tool and die steels stainless steels

[arpenter steel

electronic and magnetic alloys
special-purpose alloy steels

valve, heat-resisting and super alloy steels

tubing and pipe fine wire specialties





Modern Cooper-Bessemer Units

offer high efficiency, low operating cost

FOR OXYGEN PRODUCTION

If you are shaping up plans for new or improved oxygen production facilities, be sure to get acquainted with the distinct advantages offered by Cooper-Bessemer compressors and expansion engines.

For one thing, there are both reciprocating and centrifugal compressors in a wide range of types and sizes—exactly the right equipment without compromise. And, for unmatched efficiency in the air or gas expansion cycle, there are the outstanding Cooper-Bessemer expansion engines.

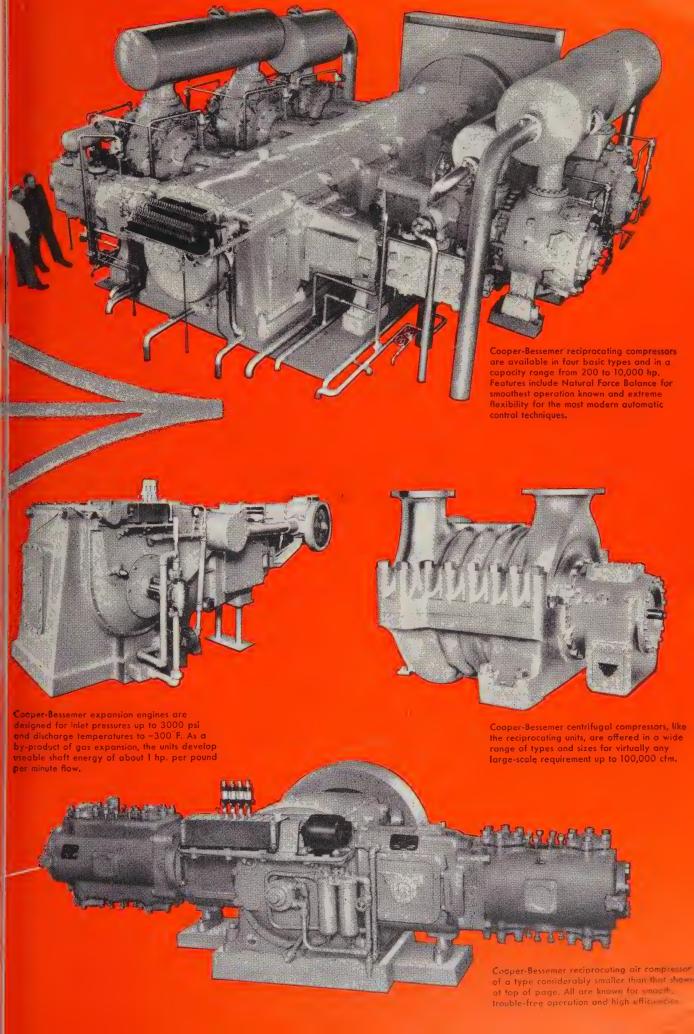
With extensive experience in supplying high volume compressors and expanders for today's most advanced oxygen production operations, Cooper-Bessemer can be of help to you in your planning. For detailed performance data, for engineering help to whatever extent you require, just get in touch with the nearest Cooper-Bessemer office.

BRANCH OFFICES: Grove City • New York • Chicago • Washington • San Francisco Los Angeles • Houston • Dallas • Odessa • Pampa • Greggton • Seattle • Tulsa St. Louis • Kansas City • Minneapolis • New Orleans • Shreveport

SUBSIDIARIES: Cooper-Bessemer of Canada, Ltd... Edmonton • Calgary • Toronto Halifax • Cooper-Bessemer International Corporation... New York • Caracas, Mexico City



ENGINES: GAS - DIESEL - GAS-DIESEL COMPRESSORS: RECIPROCATING AND CENTRIFUGAL, ENGINE OR MOTOR DRIVEN

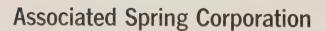




Up with the Whirlybirds . . .

What helps this helicopter hover? It's an engineering principle — angle of tilt of rotor blades and speed of revolution. What's at the heart of the rotor assembly? Among other things, this rugged spring and tension bar made by an A.S.C. Division. The same exacting "aircraft quality" that produces these and hundreds of other high duty aircraft springs is available to manufacturers in any industry whose standards demand the best.

Write for a copy of "How to Solve Your Spring Design Problems" to learn how early consultation with the spring manufacturer results in improved design and performance.





Raymond Manufacturing Division, Corry, Penna.

F. N. Manross and Sons Division, Bristol, Conn.

San Francisco Sales Office, Saratoga, Calif.

Ohio Division, Dayton, Ohio

General Offices: Bristol, Connectice

Wallace Barnes Division, Bristol, Conn. and Syracuse, N. Y. B-G-R Division, Plymouth and Ann Arbor, Mich. Seaboard Pacific Division, Gardena, Calif.

Cleveland Sales Office, Cleveland, Ohio

Canadian Subsidiary: The Wallace Barnes Co., Ltd., Hamilton, Ontario and Montreal, Quebec

William D. Gibson Division, Chicago 14, IIII
Milwaukee Division, Milwaukee, Wis.
Dunbar Brothers Division, Bristol, Conn.
Wallace Barnes Steel Division, Bristol, Con

CALENDAR

OF MEETINGS

Dec. 28-31, American Marketing Association: Winter meeting and exhibit, Morrison Hotel, Chicago. Association's address: 27 E. Monroe St., Chicago, Ill. Secretary: Schuyler F. Otteson.

1959

an. 11-14, Institute of Scrap Iron & Steel Inc.: Annual convention, Waldorf-Astoria, New York. Institute's address: 1729 H St. N.W., Washington 6, D. C. Executive vice president: Edwin C. Barringer.

an. 12-16, Society of Automotive Engineers: Annual meeting and engineering display, Sheraton-Cadillac and Statler-Hilton Hotels, Detroit. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

an. 14-16, American Management Association: Research and development conference, Roosevelt Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y. R&D's division's manager: Philip Marvin.

an. 15, Malleable Founders' Society: Semiannual meeting, Hotel Sheraton-Cleveland, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

an. 19-20, Industrial Heating Equipment Association: Annual meeting, Hotel Sheraton-Cleveland, Cleveland. Association's address: Associations Bldg., Washington 6, D. C. Secretary: Robert E. Fleming.

an. 19-21, Southern Industrial Distributors Association: Winter meeting, Biltmore Hotel, Palm Beach, Fla. Association's address: 1626 Fulton National Bank Bldg., Atlanta, Ga. Secretarytreasurer: E. L. Pugh.

an. 20-21, Steel Shipping Containers Institute Inc.: Winter meeting, St. Regis Hotel, New York. Institute's address: 600 Fifth Ave., New York 20, N. Y. Secretary: L. B. Miller.

an. 21-23, American Management Association: Special packaging conference, Biltmore Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y.

an. 21-25, National Tool & Die Manufacturers Association: Winter board meeting, Emerald Beach Hotel, Nassau, Bahamas. Association's address: 907 Public Square Bldg., Cleveland, Ohio. Executive vice president: George S. Faton

an. 22, Hoist Manufacturers Association:
Annual meeting, Palm Beach Biltmore
Hotel, Palm Beach, Fla. Association's
address: I Thomas Circle, Washington
5, D. C. Executive secretary: Joe H.
Peritz.

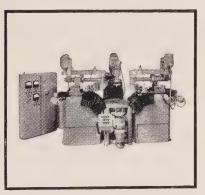


AFTER BRUSHING

Burrs thoroughly removed... edges and surface junctures blended to 6-8 microinches. Each part precision-finished quickly, uniformly. Osborn Brusbamatic, finishing time: 6 minutes.

6 minutes to microfinish this jet engine part!

...it's 71/2 times as fast with OSBORN Brushamatic® Methods



THESE JET ENGINE PARTS are microfinished at low cost, automatically—at high production rates on Osborn Brushamatic 51-3L Machine. Three Osborn Fascut burshes (with compound) operating at 1750 rpm do the job.

IT used to take 45 minutes to hand-finish this precision jet engine component. Today, this leading jet engine manufacturer does the job in just 6 minutes with Osborn Brushamatic. Methods. It's 7½ times as fast and results in significant dollar savings.

Slow hand-finishing still left scratch marks to cause possible stress fractures. But, rapid Brushamatic® finishing produces a precision 6 to 8 microinch surface . . . automatically removes burrs . . . blends sharp edges and surface junctures.

Result: a fast, economical, precision Brushamatic® finish that reduces stress concentration areas. Uniform, high-quality parts are produced at high production rates.

It's typical of how Osborn Power Brushing works to help you speed production...cut costs ... improve product quality. An Osborn Brushing Analysis, made in your plant at no obligation, will show you how. Write or wire us for details—and for your copy of the 20-page Brushamatic® booklet. The Osborn Manufacturing Company, Dept. S-1, Cleveland 14, Ohio.



BRUSHING MACHINES • BRUSHING METHODS

POWER, PAINT AND MAINTENANCE BRUSHES • FOUNDRY PRODUCTION MACHINERY

THE STEEL SCAFFOLDING COMPANY.

MANUFACTI HERS OF THE STATE SINCE 1912

January 9, 1957

Mr. C. H. Lausberg Area Development Department West Penn Power Company Cabin Hill Greensburg, Pennsylvania

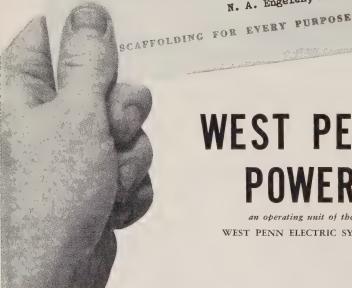
Dear Clem:

Needless to say, I am more than pleased that the final decision reached was on locating our new plant in Western Pennsylvania. In no small measure, a good deal of the credit rests with you and your associates and your untiring efforts. Your clear presentation of facts simplified our problem of sorting out the myriad of claims that so many communities set forth. It was gratifying to note that the Greater Uniontown Industrial Fund was well aware of the role you played and so acknowledged by the "plug" in the local paper announcements.

Many thanks for the Directory of Products and Manufacturers. It will be very helpful for future reference.

Sincerely,

N. A. Engelen, Secretary



WEST PENN POWER

WEST PENN ELECTRIC SYSTEM



Hello . . .

I'm Charlie Fife . . .

This letter is very complimentant But we won't accept all that credit.

Our part is quite simple. All we do is determine your requirements. Once we've done the the only skill is to make sure that opportunities in our area apply to you. You see, we live ho . . . know in detail the favorable tax climate that encourages industry. We know the localities that offer 100% financing plans at low interest. We know where labor and skills are available.

We take credit for just this: We like to add two plus two and get four-no fractions. If you'd like us to work on your side of the equation, let us know. We've got a pretty good record d fours. Won't you let us prove it in confidence, of course.

CHARLIE M. FIFE, Manager Area Development Departmet

	WEST <i>ern</i>
Area Development Department, West Penn Power Company, Cabin Hill, Greensburg, Pennsylvania	☐ Please have representative call ☐ Please send "Plant Location Services" booklet
Yes, I'm interested in WESTern PENNsylvania.	☐ Please send "Directory of Products & Manufacturers"
Name	Title
Company	
City	Zone State



Up go wire coils out of the way... <u>Down</u> go handling costs

We're anxious to do far more for our customers than simply take their order and ship the wire. Because we handle so much wire in our own plants, we have learned a lot of money-saving methods. And we're glad to pass them along to you.

For example, coils of wire unloaded in customers' plants are often simply piled on the floor, wasting floor space, cluttering aisles, creating inventory control problems and production headaches.

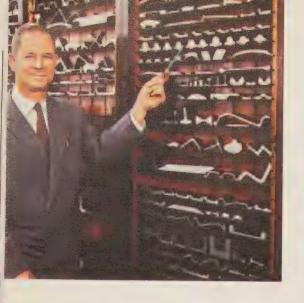
Bethlehem engineers helped one customer solve his wire storage problem as shown above. Built largely of steel pipe, these racks more than triple the storage capacity of the floor area. Coils are stored out of the way by lift truck—and quickly removed when ready for use.

We'll gladly help you with such things as payoff reels and other equipment that will help you cut your wire-handling costs. We can be of special help in wire storage problems because we furnish steel racks of various types.

And remember, too, we make just about every kind of steel wire—both ordinary and special-purpose types. Just get in touch with the Bethlehem sales office nearest you, or write us direct.



Bethlehem engineers will help you with your steel-working problems



We hot-roll bars to y

We regularly supply a variety of manufacturers with "tailor-mades special steel sections, hot-rolled to precise dimensions. Rolling to size and shape puts strength where it's most needed. And it cut machining and fabricating operations, reduces scrap loss, ofter permits better product design.

There's no end to the versatility of Bethlehem special sections. They're used in typewriters, pianos, lawn mowers; in railroad cars electric motors, and automobile hinges. How about *your* products. Perhaps Bethlehem could help you make them better, faster, cheaped—with hot-rolled special sections. Phone our nearest sales office or write us at Bethlehem, Pa.



ecial section

RAILROAD BRAKE BEAM SECTION

Compressing the "T" forces "round" outward to form strong, one-piece solid truss.

PRE-FORMED BLANKS FOR AUTO TRUNK LATCHES

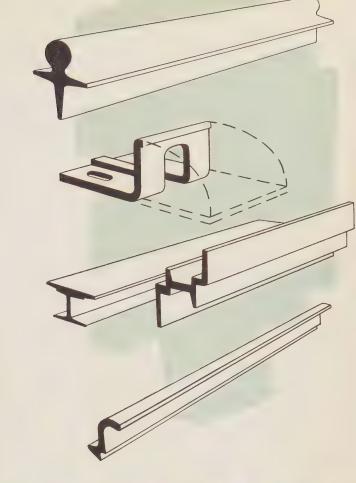
Cold-formed by customer in a closed die.

COMPLEX DESIGNS FOR WINDOW-SASH SECTIONS

Hot-rolled to customers' specifications.

TRUCK TIRE SIDE RING MADE FROM SPECIAL SECTION BAR STOCK

Extra metal rolled into critical points.



In handling this 26-ft, 73-ton shaft, it was necessary to choose the slings with exceptional care. Strength, of course, was all-important. Two types of Bethlehem slings were used—8-part braided slings, and grommet slings with equalizing thimbles. As the photograph shows, the braided slings—with their wide, load-gripping surfaces—were passed around the shaft, then looped over crane hooks suspended from the grommets.

Your own lifts aren't likely to be of such large size. But whether you're handling many tons or just a few hundred pounds, you can lift with confidence when you use Bethlehem wire rope slings.

We make all types. Single-part, double-part, bridles, grommets, etc. Our engineers will design any type of sling for specialized needs, and furnish them quickly. Write for Catalog 368-A, Bethlehem Slings and Fittings.





Safe and easy...

Forming 100,000 red-hot brackets...



he camera catches the action as the die slams to form a red-hot bracket.

a tough test for tool steel.

Here's a tough test for this hot-work grade of tool steel—forming 100,000 red-hot guard rail brackets, before die redressing is required

The tool steel used in the bulldozer is Bethlehem's Cromo-Not-work tool steel. This 5 pct chromium grade, with additions a tungsten and molybdenum, is one of our most popular tool steek for hot-work applications.

Each bracket is made from a piece of 4 in. x 1/4 in. Bethlehem flat carbon steel, cold-punched and sheared to size. Heated red-hor it is bent into a "U" shape. Then the bar is pressed into semi-final shape, and finally, the third set of Bethlehem Cromo-W dies "setsy the bracket by wrapping it around a mandrel, giving the finisher bracket a backbone.

In addition to Cromo-W, Bethlehem manufactures a completerange of other hot-work tool steels for die-casting and extrusion work. In fact, Bethlehem makes top-grade tool steels for every job in the shop. See your nearest Bethlehem tool steel distributor for full details . . . and fast delivery of the right grade for your job Remember, too, that Bethlehem engineers are always at your services.

Bethlehem Steels and Specialties

Here is a partial list of steels and specialty products in the Bethlehem line:

BARS AND BILLETS:

Carbon and alloy AISI grades Leaded carbon and alloy steels Special rolled sections

TOOL STEELS FOR EVERY JOB (28 grades)

FORGINGS: Drop, press, hammer, and upsetter Rolled-and-forged special sections

SHEETS: Hot- and cold-rolled Continuously galvanized

TIN MILL PRODUCTS: Electrolytic and hot-dip tin plate; black plate

PLATES: Universal and sheared

ROD AND WIRE: General and special-purpose types Fine and shaped wire

WIRE ROPE AND SLINGS

FASTENERS: Standard bolts, cap screws, rivets Special fasteners

PIPE AND TUBES: Continuous butt-weld

Continuous butt-weld Electric resistance-weld

STRUCTURAL SHAPES

COLD-FORMED SHAPES

PALLET RACKS

WELDMENTS: Frames, tanks, etc.

RAILS: Tee, crane, girder

CASTINGS: Carbon, alloy, and stainless steel
Grey iron; brass and bronze

PUBLICATIONS DEPARTMENT
BETHLEHEM STEEL CO., BETHLEHEM, PA.

Gentlemen: I would like additional information on

Name____

Address_____

City and State_

Bethlehem Steel Company, Bethlehem, Pa.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation Export Distributor: Bethlehem Steel Export Corporation



BETHLEHEM STEE

Folder 672

5812, Printed In U.S.A



SURE CURE FOR INSOMNIA-

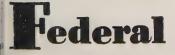
count all 12,347 Federal Ball Bearing sizes



Happy dreams. But before you doze off, we'd like to make this point: Federal makes ball bearings in this tremendous range of sizes so that the right bearing is always available for all applications. And a list of the leading manufacturers who have taken advantage of this reads like a who's who of American Industry. By way of illustration, we might mention Universal Winding, Caterpillar, Ingersoll-Rand, Cutler-Hammer, IBM, and scores of others. The motors in your own shops, the appliances in your home may well owe their smooth performance to Federal Ball Bearings.

When Federal Ball Bearings are part of so many things you use, shouldn't they be part of the things you make?

THE FEDERAL BEARINGS CO., INC. - POUGHKEEPSIE, NEW YORK



rederal Ball Bearings One of America's Largest Ball Bearing Manufacturers



KEEPS CUTTING FLUIDS AS FRESH AS A DAISY

Here's why **ELCIDE** 75[™] can increase the useful life of your soluble oil emulsions:

Elcide 75 controls harmful bacteria that enter standard duty soluble oil emulsions and cause rancid odor, acidic corrosion, and emulsion breakdown. Prior to the development of Elcide 75, certain bacteria developed immunity to commonly used germicides, and no single inhibitor could control their damage.

Elcide 75 is a combination of proven anti-bacterial agents, and includes a powerful new compound related to one of the safest and most effective bacterial inhibitors used in the exacting field of medical surgery today. Just one ounce treats 4 gallons of emulsion.

Elcide 75 is not a "built-in additive" that is weakened by larger emulsion ratios. With Elcide 75 you know you have an effective, safe treatment because you add it to the emulsion right in your own plant.

Elcide 75 is completely safe for employed machinery, and products. Not only is it not toxic and harmless to sensitive skin, but anti-bacterial action reduces the chance for infection caused by contaminated emulsions.



Bacteria cause emulsion trouble. This is a photomicrograph of Pseudomonads, one of the harmful types of bacteria found in oix water emulsions. They enter the emulsion through the air, water, an plant debris, and make it possible for sulfate-reducing bacteria cause odor, corrosion, and emulsion breakdown. Elcide 75 control a much wider range of these and other types of damaging bacteria

WHAT ELCIDE 75 MEANS TO THE METALWORKING INDUSTRY...

Operating costs can be greatly reduced because of Elcide 75. This saving is an accumulation of everal important benefits.

Actual shop tests have shown that one ounce of Elcide 75 added to each four gallons of emulion can keep the oil-water emulsion fresh as much as $5\frac{1}{2}$ times longer. In one test, emulions that normally had to be dumped at the end of four weeks ran for 22 weeks when treated with Elcide 75!

You can benefit by three direct savings—costly abor and down time for recharging will be

reduced, your soluble oil requirements will drop, and the disposal cost of spoiled emulsions will diminish.

Elcide 75 also contributes to better products and longer machine tool life because it controls the bacteria which often cause acidic corrosion.

You can have a cleaner plant by using Elcide 75. It eliminates objectionable odors as well as bacteria that may cause skin infection. Elcide 75 is nontoxic and safe to use, as proved by tests conducted under normal shop conditions.

BACTERIAL PLATE COUNTS PROVE KILLING POWER OF ELCIDE 75



Emulsion treated with Elcide 75



Emulsion treated with commonly used germicide at recommended level



Emulsion treated with commonly used germicide at double the recommended level



Untreated emulsion

The photographs shown above illustrate the broad, powerful anti-bacterial action of Elcide 75. The light areas are bacterial colonies that have grown in three of the emulsion

samples during 8 weeks' use. Note that none of these harmful bacteria appear in the emulsion treated with Elcide 75 during the same 8-week period. The emulsion stayed fresh.

PUT ELCIDE 75 TO WORK FOR YOU

The best way to determine the value of Elcide 75 to your own operation is to try it under normal plant conditions, using your standard duty emulsion. After you compare the costs of operation, you will agree that Elcide 75 is a valuable discovery that deserves a permanent place in your plant. Why not try Elcide 75 soon?





PRODUCT SPECIFICATIONS ELCIDE 75

(Lilly's brand of bacterial inhibitor for cutting fluids)

Active Ingredients—Sodium Ethylmercuri Thiosalicylate (Thimerosal) and Sodium *o*-phenylphenate.

Package
1-gallon polyethylene
5-gallon polyethylene
5-gallon stainless steel
6. Price per Gal.
88.50
\$8.00

This product is sold only through selected distributors.

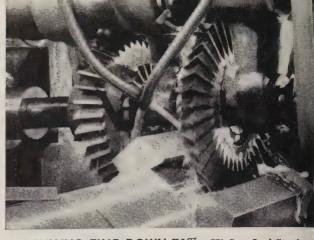
For further information or to place your order, write or phone:

ELI LILLY AND COMPANY, AGRICULTURAL AND INDUSTRIAL PRODUCTS DIVISION, INDIANAPOLIS 6, INDIANA

TELEPHONE: MElrose 6-2211



SAVES \$150 PER GEAR—In cutting a double-web design fabricated gear on a gear generator, tool cost formerly averaged \$180 per gear. By switching to ALCO Hi-Qua-Led Steel with its lower friction component, tool wear is reduced, and manufacturer reports savings of approximately \$150 per gear.



MILLING TIME DOWN 71%—Hi-Qua-Led Steel opline forgings enabled a machine tool builder to reduce till for straddle-mill dovetailing of pentagon shape by 71 Overall time for piece, including milling, turning a trepanning, is cut 33%, and a significant saving in to is also noted.



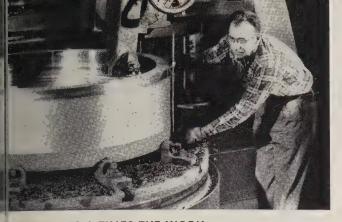
IMPROVED FINISH—A manufacturer reports a much smoother gear finish with ALCO Hi-Qua-Led Steel. There is a complete lack of burrs which formerly required extensive hand filing to remove. In addition, time for this cutting operation on a Fellows gear shaper is reduced 47%, and tool wear is down 20%.



700% INCREASE IN TOOL LIFE—In trepanning a in. diameter hole 42½ in. long with a Warner & Swasslathe, tool life averaged one piece per tool. With Hi-Qua-Le 8 pieces are now obtained with the same tool. Manufacture reports that Hi-Qua-Led Steel also provides much better the formation.

EASY-MACHINING HI-QUA-LED STEEL* FORGINGS GIVE INDUSTRY NEW OPPORTUNITY FOR PROFIT

* HI-QUA-LED STEEL—ALCO's registered trademark for its new process leaded-steel forgings that are making outstanding reductions in tool wear, machining time and production costs.



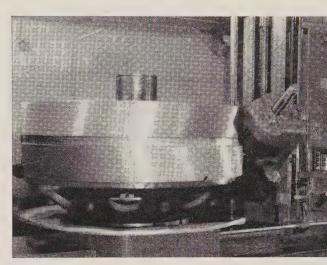
TOOL DOES 3 TIMES THE WORK—With Hi-Qua-Led Steel, a King boring mill operation that once required 3.4 hours is off the machine in 43 minutes. Through the lower frictional properties of Hi-Qua-Led Steel, the manufacturer obtains 10 pieces per tool grind as compared to 3 pieces obtainable with non-leaded steel.



FASTER SPEEDS, NORMAL TOOL WEAR—A gear manufacturer using a Fellows gear cutter was able to increase rough-cut speed 37% and finish-cut speed 111% with Hi-Qua-Led Steel. Smoother operation is noted, and the tremendous reduction in machine time is accomplished with only normal wear to cutter.



8-HOUR JOB DONE IN 3—Another manufacturer r ports that roughing and finishing a gear required a total 8 hours and 8 minutes on his gear cutter. With free machining Hi-Qua-Led Steel and the increased speeds ar feeds it permits, the job is now completed in just hours and 10 minutes.



SAVES FULL WORK WEEK—Using gear blanks of ord nary steel, roughing and finishing on a Gould and Eberham machine previously required 65.1 hours. The improve machining qualities of Hi-Qua-Led Steel have speeded a gear production and the job is now completed in 24 hours, saving a 40-hour work week.

The easy machinability of Alco's Hi-Qua-Led Steel® forgings is setting new production records and boosting profit throughout industry. While maintaining all the physical characteristics of regular steel in any AISI grade, forgings of Hi-Qua-Led Steel, Alco's special process leaded steel, provide the extra benefits of greatly reduced machine time, longer tool life and improved surface finish. In addition, the reduced friction component of Hi-Qua-Led Steel forgings assures much closer tolerances.

By switching to Alco's Hi-Qua-Led Steel forgings in your operation, you can cut your machining costs drastically. Along with this reduction in costs, Hi-Qua-Led Steel forgings will provide the same service in your end product as you obtain with regular forgings.

Alco specialists are available to show you—on your own machines, in your own plant—how Hi-Qua-Led Steel forgings will boost your profit. Forgings are available in seamless rolled circular shapes from 18 to 145 in. OD, in open-die shapes from 1,000 to 30,000 lb and 40 ft long, and in mandrelled seamless circular shapes up to 60 in. wide. Contact the Alco sales office nearest you for complete details. For a booklet containing technical information on Hi-Qua-Led Steel forgings, write Alco Products, Inc., Dept. 153, Schenectady 5, New York.

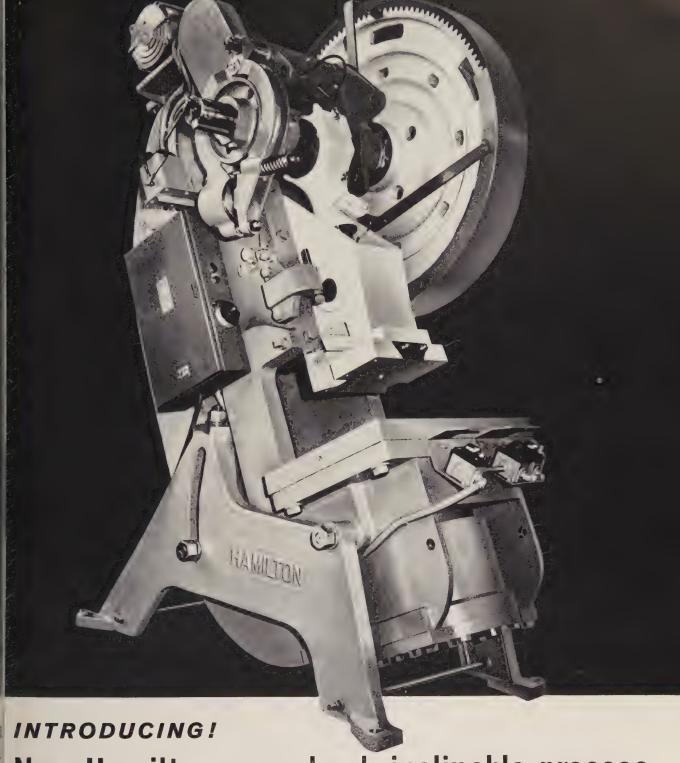


ALCO PRODUCTS, INC.

NEW YORK

SALES OFFICES IN PRINCIPAL CITIES





New Hamilton open-back inclinable presses

Special features of Hamilton OBI Presses include stress-relieved welded steel design — lowers deflection so that up to 50% more stampings can be produced before dies require regrinding; disc-type air clutch, mounted on the crankshaft, to permit low-

inertia starting with reduced heat generation; special air-released, spring-actuated brake for maximum efficiency and production speed with low heat loss; extreme stability and wearing qualities made possible by a wrist pin and crosshead type connection.

Write to Dept. 1-M for Bulletin 13302

Hamilton Division Hamilton, Ohio

BALDWIN · LIMA · HAMILTON

BLH FERNALION



He proved that wheel could outperform at Steelcraft Tool Co.

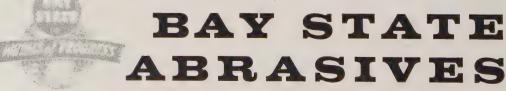
Steelcraft Tool Co., of Detroit, used to use three different grinding wheels to grind angles on straight high speed steel form tools. Then Bay State distributor Jim Frederick, of Detroit's Industrial Abrasives Co., showed them how a single Bay State specification would cut fast for roughing and fine for finishing.

Result: Costly wheel changes were cut way down and both Roland Belardnelli, co-owner of Steelcraft, and John Kulpa, chief operator, rate the new wheel A-plus for speed and precision, too.

Your Bay State distributor may come up with more than one cost-saving idea for you. Better grinding at lower cost—that is his business.



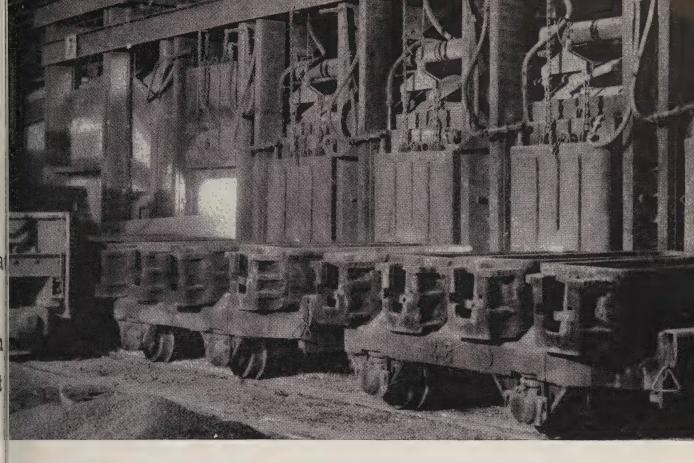
Steelcraft operator John Kulpa checks performance of new Bay State wheel on high speed steel form tool job. (Guard removed for photography).



Bay State Abrasive Products Co., Westboro, Massachusetts.

In Canada: Bay State Abrasive Products Co., Brantford, Ontario.

Branch Offices: Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh. Distributors: All principal cities.



Charging-Box Cars . . . built to last by a company that uses them!

j unique structural features make them better

harging-box cars have to take a lot of punishment.

nd, in the 36 years we have been making charging-box

urs for our own use, United States Steel has developed

veral features in structural design that assure longer

fe, less maintenance, and dependable service.

As illustrated in the typical four-box car shown here, ne advantages of these design features—plus the rugged urability of all-welded *rolled* steel construction—make ny size USS Charging-Box Car a profitable investment.

Our representatives will be pleased to call at your onvenience to discuss your requirements for this or any ther type of industrial car. Meanwhile, write for our ree illustrated booklet—USS Custom Designed Cars. Inited States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS is a registered trademark



United States Steel Corporation—Pittsburgh Columbia-Geneva Steel—San Francisco Tennessee Coal & Iron—Fairfield, Alabama United States Steel Export Company

United States Steel











Box girder construction: Two channel sections, welded toe-to-toe, provide a frame far stronger than the ordinary angle or channel frame. This box frame is used under both the sides and ends of the car.

Double center sills: Two channels, back to back, run the entire length of the car. All cross members are welded to these sills, providing superior longitudinal rigidity.

X-frame bracing: These cross braces tie the box girder frame and the center sills together for additional strength and rigidity.

Spring pockets: Over each wheel, pockets are built into the bottom of the frame and "boxed in" on all sides. Coil springs are set into these pockets. This construction permits vertical, but no lateral, movement of the springs.

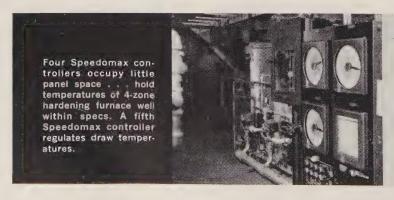
Long-shanked couplers: Pivot points of couplers are behind each axle. This permits turning the car on a short radius curve with less wheel flange pressure than with a short-shanked coupler.



Lamson & Sessions Co.: Operator checks loading of furnace used to harden bolts made of 1038, 1335 and 4140 steel.

Reproducibility of hardening temperatures a problem?

Not at Lamson & Sessions Co.'s Chicago plant, where Speedomax® H controllers are helping to assert reproducibility of hardening specs for nuts and bolts. With competition keen, dependability and reproducibility of processing equipment is a "must". Since installation nearly two years ago, Speedomax H been controlling temperature of hardening and draw furnaces 5 days/wk, 24 hrs/day. Weekends, reaces idle at control temperature. Maintenance has been negligible . . . temperature always will specs. Rugged, compact and completely reliable, Speedomax H is providing the same dependable components and a quality prown. Whatever your heat treating process, it'll pay you to investigate Speedomax H! For details, contact are nearest L&N office or write 4957 Stenton Ave., Phila. 44, Pa.





NORTHRUP
Automatic Controls - Furnaces



JNILOY STAINLESS STEELS

brighten homes, brighten sales with life-long beauty

The gleaming beauty, plus the permanence and ease of cleaning have made stainless steel the wife's delight—and sold many a home.

When made from Uniloy stainless steel, flatware, utensils, and other kitchen accessories have that inviting blend of beauty and permanence so appealing to the modern homemaker.

Uniloy stainless steels—easy to work and form—are rolled to most exacting specifications by steel makers who have been making specialty steels since 1884.



STAINLESS STEELS . TOOL STEELS . HIGH TEMPERATURE METALS

ecember 15, 1958 39

sales 1200///

when your product offers new precision and efficiency...



The Warren C. Portman Company uses the Saginaw b/b Screw to smoothly and accurately raise and lower the camera carriage on its new titling, animation and special effects camera stand.

with the

Saginaw Screw

"WE'VE FOUND THAT THE SAGINAW SCREW IS A DEFINITION SALES FEATURE in our new special effects camera stand, when precision control and smooth operation is essential to 'Zoom' and other special motion picture effects," says Mr. Warren Portman, Warren Conrad Portman Company, photographic equipment manufacturers.

A more profitable sales picture can zoom into focus fator... when you do as the Portman Company has done switch from a high-friction acme screw to the virtual frictionless Saginaw b/b Screw for greater Sales Appear

The truly amazing ability of the Saginaw Screw to converrotary motion to linear motion with over 90% efficiency i saving power, space, weight and assuring smoother, mondependable performance in countless products from ministure electronic controls to giant production equipment

Perhaps the Saginaw Screw can give your products that vital new Sales Appeal you're looking for right now. The find out, write or telephone Saginaw Steering Geast Division, General Motors Corporation, Saginaw, Michigan —world's largest producers of b/b screws and splines.

Give your products NEW SALES APPEAL... switch to the aginaw

THE RELIGIOUS AND ADDRESS OF THE PARTY OF TH

WORLD'S MOST EFFICIENT ACTUATION DEVICE







Pittsburgh Steel Seamless Tubes Help Wayne Make Clean Sweep

Nobody knows how many brooms it would take to keep the world clean. But out in Pomona, California, Wayne Manufacturing Company is ready to tackle the job with a complete line of power sweepers.

Founded only ten years ago, the Wayne Company has grown rapidly until today it produces more street and industrial power sweepers than all others in the field combined. Wayne is the only power sweeper produced by assembly-line operation.

Largest Wayne sweepers handle up to four cubic yards of debris at a time. Their assembly requires more than 1,000 complicated and accurately manufactured steel parts.

• 300 Key Parts—Of these, more than 300 key items are fabricated from Pittsburgh Steel Company's Seamless Tubing in both carbon and alloy grades in sizes ranging from onequarter inch to six inches in diameter. It is furnished cut to length and ready for fabrication by Baker Steel & Tube Company of Los Angeles, a Pittsbr Steel distributor.

This service helps speed Waproduction, keeps inventories of and is typical of service rendered all Pittsburgh distributors.

"Requirements for the paproduced from Pittsburgh tull are exacting," says Wayne I duction vice-president, Roy Nelson. "Our sweepers are do big jobs, many of them operation a 24-hour schedule, and

t have a tough, dependable luct in the critical spots to take constant heavy beating."

nat is why Wayne uses Pittsgh Seamless Tubing in critical ponents such as rugged axle emblies, torque housings. e shafts, hydraulic actuating nders-even small fittings.

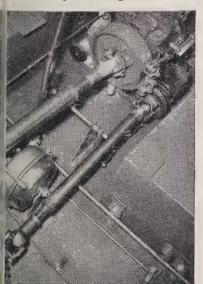
ver the years, Wayne production have found Pittsburgh tubing has surface finish, close size tolerance concentricity which minimize the unt of machining that must be . Its uniformly high physical erties and internal soundness prothe stamina necessary for long, ble-free service.

se of Fabrication-The maability and weldability of Pittsh tubing make for ease of fabricakeep scrap losses down, and re uniform parts-all important ors in keeping production lines ing smoothly.

an aid to industrial good houseping, Wayne produces smaller er sweepers for use inside and outi plants. Its newest line is the bette series which includes the horous "Golfmobile" and the ly "Cruise About." Three indusmodels provide efficient transport rersonnel and materials in sprawl-

bese industrial sweepers and Autoalso depend upon Pittsburgh I tubing for parts in key assemblies. anufacturers find the uniformly quality of Pittsburgh cold-drawn seamless tubing and excellent ice from Pittsburgh distributors big assets in improving products operating efficiency. To enjoy be benefits get in touch with the esentative nearest you.

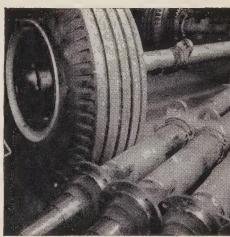
sburgh tubes withstand torque fatigue in main and auxiliary es on Wayne sweepers.





Machinability and weldability of Pittsburgh tubes are vital in making this shaft which goes into differential assembly. Short tube is welded over longer, smaller diameter tube, then machined to tolerance of .001 inch to assure perfect fit in housing.

Rugged front axle assembly of Wayne sweeper made from Pittsburgh tubes carries most of weight of machine and up to four cubic yards of debris. It must withstand road shocks and constant heavy-duty operation.



Pittsburgh Seamless Distributors

Baker Steel & Tube Company Los Angeles, California

Chicago Tube & Iron Company Chicago, Illinois

Cleveland Tool & Supply Co. Cleveland, Ohio

Drummond McCall & Co., Ltd. Montreal, Quebec, Canada

Edgcomb Steel Company Philadelphia, Pennsylvania

Gilmore Steel & Supply Co. San Francisco, California

Earle M. Jorgensen Co. Perry Kilsby, Inc. Los Angeles, California

Mapes & Sprowl Steel Co. Union, New Jersey

Metal Goods Corporation St. Louis, Missouri

Miller Steel Company, Inc. Hillside, New Jersey

A. B. Murray Co., Inc. Elizabeth, New Jersey C. A. Russell, Inc. Houston, Texas

Ryerson, Joseph T. & Son, Inc. Chicago, Illinois

Solar Steel Corporation Cleveland, Ohio

Steel Sales Corporation Chicago, Illinois

Tubular Sales

Detroit, Michigan Ward Steel Service Company

Dayton, Ohio

Pittsburgh Steel Company

Dayton

Grant Building

Pittsburgh 30, Pa.



District Sales Offices

Atlanta

Detroit Houston Los Angeles New York Philadelphia Pittsburgh Tulsa

Cleveland Dallas Chicago

Warren, Ohio



New

Longer-Wearing

Pattern in Wire Rope Styles!

After three years of extensive field trials this, the newes of Roebling's wire ropes, is now ready to go to work for you on a service basis that will exceed that of the wire rope you are now using.

Roebling Herringbone* combines the best features of both regular and Lang lay rope constructions; being made up of two pairs of Lang lay strands and two strands of regular lay. The regular lay strands separate the two pairs of Lang lay strands of Thus, in one rope you have the superior flexibility and abrasion resistance of Lang lay and the greater structural stability of regular lay.

For the past three years, under all kinds of conditions Herringbone has been used for general hoisting, holding and closing lines, shovel ropes, wagon scraper ropes and dragline ropes. The results have been wonderful... excellent flexibility, exceptional resistance to shock and abrasion smooth, easy operation around drums and over sheaves smooth spooling properties and structural stability unequalled by other rope for the same job.

There has never been a better time—or a wider need—for a wire rope that returns so much service for its cost And, in addition to being a top performer on the job, Herring bone eliminates the necessity of stocking Lang lay for one purpose and regular lay for another.

You are invited to get in touch with your Roebling distributor or write Wire Rope Division, John A. Roebling' Sons Corporation, Trenton 2, New Jersey, for further and fuller details on the *investment* qualities of this new and highly serviceable rope.

*Reg. appl. fo

ROEBLING

(FI



He's equipping this machine with the "Touch of Gold"

Grinding is always a profit-producing p in metal working. That's why the nding wheel itself is so important — d why Norton world leadership in nding is important to you when you ecify grinding wheels.

Because a Norton wheel, contacting the rk in process, is always adding the 'ouch of Gold'' . . . creating value and

usefulness through improving the fit and finish of the product. The right wheel for each job is the key to having each job done right . . . which is the real secret of profitable production. And Norton stocks more than 200,000 types and sizes of grinding wheels to make your "Touch of Gold" quickly available. Plants and distributors all around the world.

NORTON COMPANY, General Offices, Worcester 6, Massachusetts.



laking better products...to make your products better



2 to 3 times
Capacity
Greater Thrust Capacity

8 to 12 times
Longer Life Expectancy

New ROLLWAY

TANDEM THRUST BEARIN

Using axial space along the shaft, rather than enlarging the houldiameter, this new Rollway tandem thrust bearing distributes the over two or three stages of roller components. Gives 2 to 3 times a thrust capacity than conventional thrust bearings. Life expectance 8 to 12 times longer depending upon the number of stages.

8 0

TWO STAGE

22 sizes, up to 17" bore, 34" O.D., and 2,325,000 lb. capacity at 100 rpm

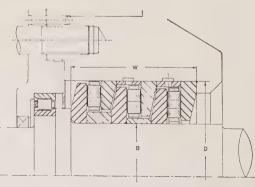
Each stage comprises a rotatable bearing ... a bronze retainer with thru-hardened rollers...a compression sleeve... and a static bearing plate. The thrust load is applied to the stage and is by-passed by each compression slin turn to the remaining stage or stages.

Calculated deformation of the bearing plates tributes the load uniformly on all rollers. A granumber of rollers in the first stage carries at 60% of the load, without increasing the load roller. Compression sleeves have cross-section areas proportional to the load imposed. Roller ance is held within one ten-thousandth inch.

Complete Specifications on Rollway Tandem Thrust Bearings, as well as other up-to-date information on bearing design is yours for the asking. See your Rollway engineer, or write: Rollway Bearing Company, Inc., Syracuse, N. Y.

THREE STAGE TANDEM

5 sizes, up to 17" bore, 34" O.D., and 3,410,000 lb. capacity at 100 rpm



Tandem Thrust Bearing manufactured by Rollway Bearing Company, Inc. under U.S. Patent Number 2,374,820.

ROLLWAY

COMPLETE LINE OF RADIAL AND THRUST CYLINDRICAL ROLLER BEARINGS

ENGINEERING OFFICES: Syracuse • Chicago • Toronto • Cleveland • Seattle • San Francisco • Boston • Detroit • Pittsburgh • Houston • Philadelphia • Los And



Phone: HUbbard 1-3200

Weldynamics



ARC WELDING AT WORK CUTTING COSTS

Switch from cast iron to welded steel saves 61% on blower hubs

Because steel is 3 times stronger, 2½ times more rigid and costs ½ as much as cast iron a blower manufacturer was able to cut costs of blower hubs 61%.

Additional advantages of welded steel are:

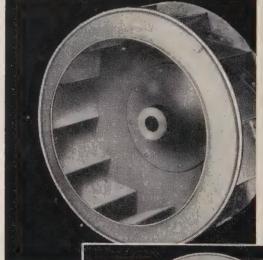
- 42% lighter permitting use of lighter bearings and shafts
- Higher maximum speeds-no danger of fracture
- Easier balancing
- Better appearance

Your product can be made better at less cost with welded Steel. A Lincoln man trained in Weldynamics will help you. Call or write.

DESIGN AIDS!

"Procedure Handbook of Arc Welding Design and Practice" new 11th edition has 1300 pages, 1100 illustrations, 240 pages on Machine Design. \$3.00 postpaid in U.S.A., \$3.50 elsewhere. Send for Machine "Design Ideas", free to engineers and supervisors.

Machine Design Seminars, conducted at our Cleveland Plant.





(Top) Blower rotor with cast iron hub attached by rivets.

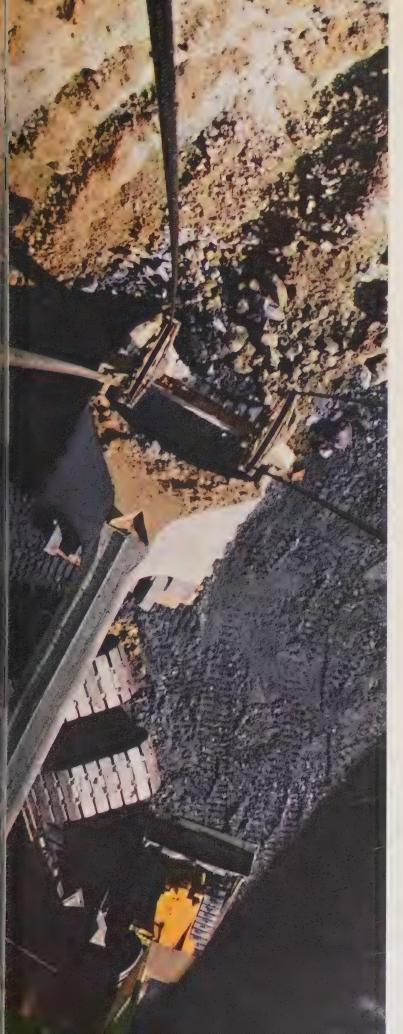
(Bottom) Same size rotor with welded and spun steel hub attached by intermittent welds.

The World's Largest Manufacturer of Arc Welding Equipment

LAINCOLN

© 1958 The Lincoln Electric Company

THE LINCOLN ELECTRIC COMPANY . DEPT. 1647 . CLEVELAND 17, OH



Big Paul digs and dumps 105 tons in 50 seconds!

USS "T-1" and TRI-TEN Steels cut dead weight—boost strength

Even from a 100-foot-high perch, the mammoth size of the bucket of Big Paul, the King of Spades, is hard to comprehend.

There are three of these 70-yard giants—all built by Marion Power Shovel Company. All achieve strength and toughness with least weight by the use of USS "T-1" Constructional Alloy Steel and USS TRI-TEN High-Strength Low-Alloy Steel.

Big Paul sets the pace at the Peabody Coal Company's River King mine near Freeburg, Illinois. It rams through rock and shale to uncover some two million tons of coal per year.

Since 1950, the art of big shovel making has increased dipper size from 35 to 45, 55, 60, and now 70 cubic yards per bite. Most of the buckets and dipper sticks of these giant shovels are made of USS "T-1" Steel, for otherwise, it would be almost impossible to make them light enough and tough enough. They hold up in this service, taking terrific impact abrasion and shock loading, even in the dead of winter. This is possible because USS "T-1" Steel retains its toughness at temperatures far below zero.

Dipper Size Increased 25%

USS "T-1" Steel has often enabled a boost in the capacity of original equipment without increasing weight. For example, a 20-yard bucket was replaced with a 24-yard "T-1" Steel job. Other dippers were boosted from 26 yards to 32, and 36 yards to 45—increases of 25%.

Many other parts—dipper stick, bail handles and crowd rack—are built stronger and lighter with this 90,000 psi minimum yield strength constructional alloy steel. (USS "T-1" Steel plates up to 2½ inches thick inclusive are now available with a minimum yield strength of 100,000 psi.)

The booms and A-frames of most shovels over 45 yards are designed with high-strength low-alloy steels with 50,000 minimum yield point . . . usually USS TRI-TEN Steel.

Perhaps you need a steel that offers higher yield strength, extraordinary toughness and resistance to impact abrasion, combined with relative ease of fabrication. USS "T-1" Steel is your answer, and we'll gladly help you adapt it to your application. For free booklet, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

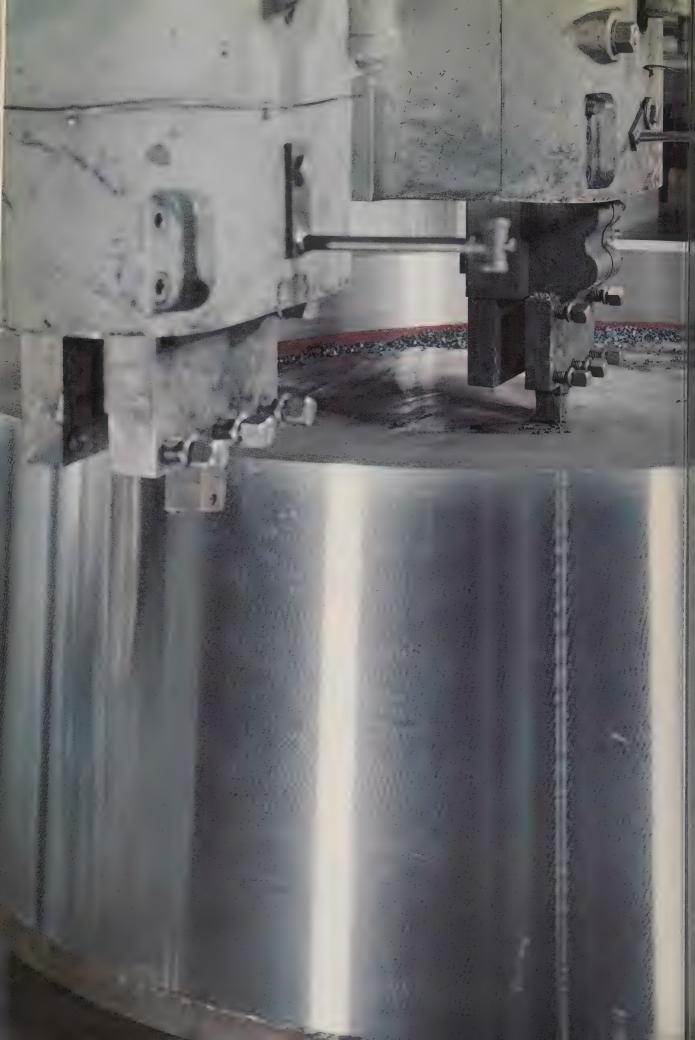
USS, "T-1" and TRI-TEN are registered trademarks

70-yard dipper and handle, crowd rack, bail and sheave blocks all built stronger and lighter with USS "T-1" Steel.



United States Steel Corporation – Pittsburgh Columbia-Geneva Steel – San Francisco Tennessee Coal & Iron – Fairfield, Alabama United States Steel Supply – Steel Service Centers United States Steel Export Company

United States Steel





12 tons of forged steel for Yankee fission

The picture shows a steam generator tube sheet forging (one of four) destined for a 134,000-KW nuclear-fueled power plant owned by the Yankee Atomic Electric Company, in Rowe, Massachusetts.

It's a \$50-million plant that uses a pressurized water reactor. The USS Quality Forging tube sheet is 85" in diameter by 26%" thick. Some 1600 holes will be drilled through the forging longitudinally, and in these holes will be placed stainless steel tubes which will carry high pressure, high temperature main coolant water.

The forged tube sheet is made from carbon steel with a pinch (.057%) of vanadium in it. Starting from the raw ingot, it was heated, forged, rough machined, normalized, tempered, rough machined again, then quenched and tempered. It received a great variety of tests along the way—including several ultrasonic tests. The forging, as shipped, weighed 25,500 pounds.

Nuclear power plant designers have known from the beginning that it is extremely important to use highest quality components. That's the reason why they come so often to United States Steel for its justly famous USS Quality Forgings. And although the one shown here is not complicated, the Forgings Division of USS Homestead District Works has produced a great many complex forgings in everything from carbon to stainless steel, including discs, tapered domes, flanges and cylinders of all types.

No matter what kind of a forging you need, isn't it a good feeling to know that the men who will make it have a solid background of experience? We'd appreciate your inquiries or requests for our free folder on USS Nuclear Forgings. Just write United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS is a registered trademark



United States Steel Corporation – Pittsburgh Columbia-Geneva Steel – San Francisco Tennessee Coal & Iron – Fairfield, Alabama United States Steel Export Company

United States Steel

ATTIAS IJUMNITI IN REFRACTORY CONCRETE DOME:



Circular Revolving Hearth Furnace featuring an unusual inner dome constructed with a castable refractory bonded with LUMNITE calcium-aluminate cement. Furnace diameter is 17 feet; 9" thick concrete dome has 289 holes (5" diameter). Heat passes downward through dome openings to anneal shells in furnace.

... for low-cost furnace construction and maintenance

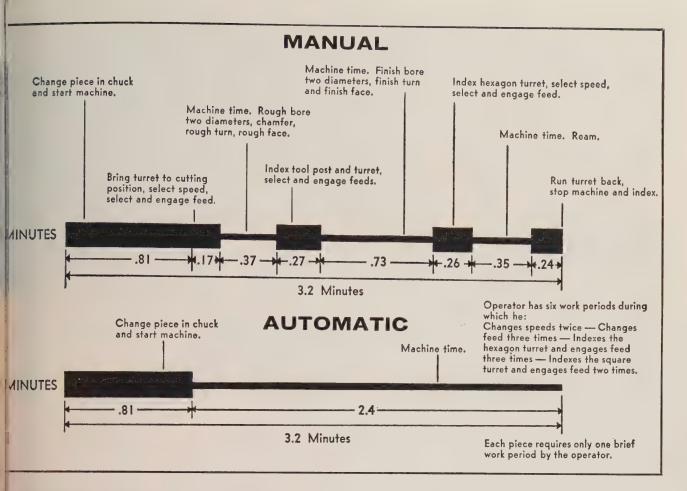
- Refractory concrete (with ATLAS* LUMNITE cement) stands up under continuous soaking heat . . . protects against thermal shock due to heating-cooling cycles . . . provides insulation.
- Easy, economical to place . . . by precasting, troweling or guniting . . . concrete reaches high strength 24 hours after placing. For maximum convenience, use castables made with LUMNITE* cement. These are packaged mixtures, ready for use. Simply add water, mix and place. Made and distributed by leading manufacturers of refractories.

Write for "Lumnite Refractory Concrete Manual"-Universal Atlas, 100 Park Avenue, New York 17, N. Y.



Universal Atlas Cement Division of United States Steel





How the new Gisholt Fastermatic makes you

MORE MONEY DURING MACHINING TIME

rastic reduction of operator time in machine handling that's the story behind the success of the new Gisholt stermatic Automatic Turret Lathe.

Evidence? Look at the chart above. Compare the time d work cycle of a manually operated turret lathe with

Gisholt Fastermatic—on the same job.

The piece, a wheel hub, is rough-bored, finish-bored, amed, rough-faced, finish-faced and chamfered. Both oss slides and three hexagon turret faces of the stermatic are used. Identical tooling on the other three xagon turret faces permits finishing two parts with ch complete index of the turret.

The contrast is startling. The manually operated uchine takes over 54% of the operator's time...the stermatic takes only 25%! The operator's "free time" doubled—giving him ample time to keep another stermatic under cut on a similar operation and also spect and stack finished parts or perform other work. You may have jobs where the new Fastermatic can ow even greater savings. Let Gisholt help you find out mail the coupon now.



Madison 10, Wisconsin

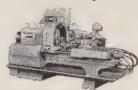
K YOUR GISHOLT REPRESENTATIVE ABOUT FACTORY-BUILT MACHINES WITH NEW-MACHINE GUARANTEE



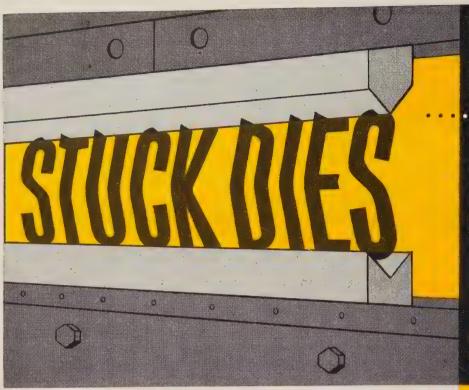


A COMPLETELY NEW MACHINE. New selector-switch control panel on Gisholt Fastermatic reduces setup time 50% or more. Operator simply chucks piece, starts automatic cycle, removes completed part. Human error is eliminated. Operator is free during machine cycle to handle additional units or to do other work. New Fastermatic is quick and

easy to set up; no cams to change. Ideally suited for longor short-run operations. Increased power, higher spindle speeds permit more efficient use of today's cutting tools. Investigate now.



Gisholt Machine Company 1217 E. Washington Ave, Madison 10, Wisconsin
☐ Send new Fastermatic Catalog 1179-A.
☐ Have Gisholt Representative call.
NameTitle
Company
Street Address
CityState



quickly, easily released with exclusive patented LODGE & SHIPL WEDGE TYPE PRESSIA RELEASE





THIS . . .

NOT THIS!

- Use wrench not a cutting torch
- in minutes instead of hours
- without damage die holder destroyed

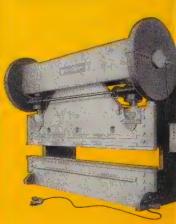
When a press brake is stalled due to improperly adjusted dies . . . do you face a short delay or near disaster?

With a Lodge & Shipley Press Brake, release of the stuck dies is a quick, simple, non-destructive matter as described in the accompanying detail.

This is but one of many outstanding Lodge & Shipley Press Brake features designed for fast, accurate, efficient and dependable press brake operation. New literature gives complete details. Write: The Lodge & Shipley Co., 3070 Colerain Ave., Cincinnati 25, Ohio.

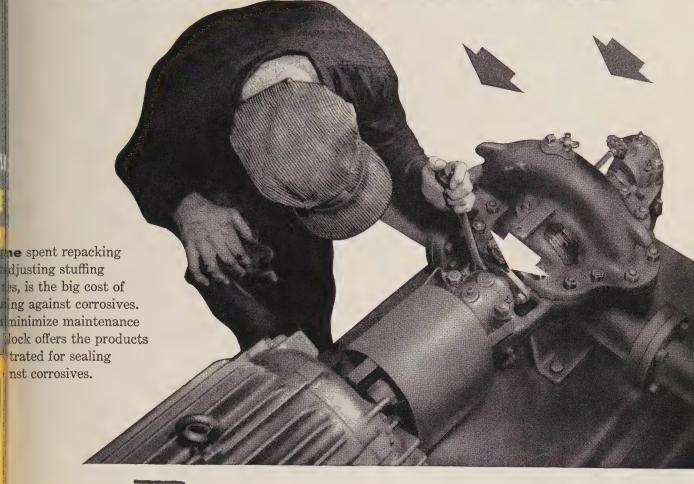


The Lodge & Shipley Wedge Type Pressure Release is unusually simpli rugged in design. A heavy steel whas a top angle that complement similar angle on the base of the pittman socket housing. Held secure a heavy steel plate, the wedges c released quickly to provide up to additional clearance.



odge & Shipley ... your Lodge-ical choice

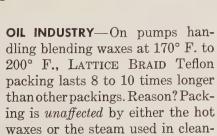
IGHTEN UP ON COSTS OF SEALING CORROSIVES



USERS REPORT:

CHEMICAL INDUSTRY—Centrifugal dye pumps required repacking every 24 to 48 hours. Switched to Garlock LATTICE BRAID asbestos with Teflon impregnation.

RESULTS: Minimum 3 months service. All the strands of this unique packing are lattice linked together into one structural unit. Each strand is impregnated with chemically inert Teflon for longer wear.



ing the pumps.



Teflon impregnated LATTICE BRAID packings are another example of the Garlock 2,000 ... two thousand different styles of packings, gaskets, and seals for every need. The only complete line. That's why your Garlock representative can give you unbiased recommendations. Call him or write for Folder AD-131.







THE GARLOCK PACKING COMPANY, Palmyra, N. Y.

For Prompt Service, contact one of our 30 sales offices and warehouses throughout the U. S. and Canada.

^{*} Garlock trademark

[†] Dupont trademark

With this **new**

socket head cap screw you can Pre-Load

without

indentation!

the new P-K® PRE-LODE

Now ... , Parker-Kalon's new PRE-LODE Socket Head Cap Screw gives you greater bearing surface under the head than ever before! With this new head, a research achievement resulting from the combined efforts of the Socket Screw Manufacturers' Technical Committee, you can now apply higher torque . . . pre-load the fastener for maximum holding power without danger of marring or indenting softer materials in which the screw engages. This means greater load carrying capacity and better functioning in holes having a greater body clearance. P-K's PRE-LODE Socket Head Cap Screws are designed for high tightening. In many cases, the socket has been enlarged to allow more wrenching area. Standard sizes 1/1" to 1" PRE-LODE Socket Head Cap Screws are Size-Marked for easy identification, and are manufactured to exacting specifications. Available now from your authorized P-K distributor at no increase in cost. Write today for complete technical data and samples.

Sold Everywhere Through Leading Industrial Supply Distributors.

PARKER-KALON® PRE-LODE Socket Head Cap Screws

PARKER-KALON DIVISION, General American Transportation Corporation, Clifton, New Jersey.

Only Parker-Kalon offers both PRE-LODE and SIZE-MARK in Socket Head Cap Screws



Ingersoll Steel Deliveries

TIMED TO YOUR PRODUCTION

Here at Ingersoll Steel we knock ourselves out to give you on-time, as-promised delivery of a wide variety of special purpose steel sheets and plates. The minute your order is received it starts getting the V.I.P. treatment—and that's the way it goes all the way to your receiving department.

Being a specialty mill, we can and do adjust our production schedules to dovetail with your production needs. And with our advantageous central location at New Castle, Indiana, prompt deliveries

are assured. Next time you need any of the products listed below, call Ingersoll Steel and you'll see what we mean.

Ingersoll Produces:

STAINLESS STEELS • HEAT RESISTING STEELS • INGACLAD STAINLESS-CLAD SHEETS • ALLOY STEELS • FORGING QUALITY ELECTRIC STEEL INGOTS • AUTOMOTIVE CLUTCH PLATE STEELS TEM-CROSS CROSS-ROLLED STEEL • CARBON ELECTRIC STEEL FOR TRACTOR CLUTCH DISCS • KNIFE STEELS • SAW STEELS HIGH SPEED HACK SAW STEELS • SOFT CENTER AND OTHER AGRICULTURAL STEELS • SPECIAL ANALYSIS STEELS



Ingersoll STEEL DIVISION

Borg-Warner Corporation

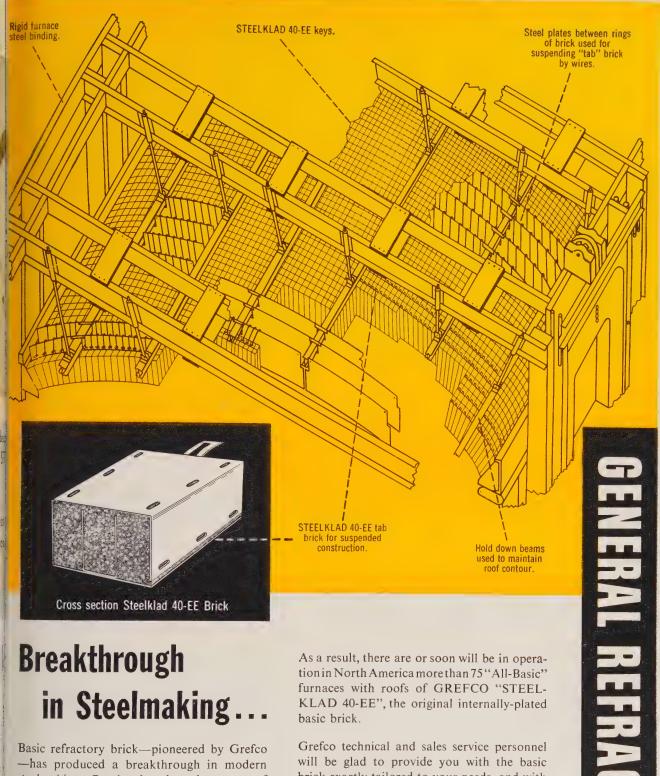
New Castle, Indiana



WASHBURN WIRE COMPANY, NEW YORK C

WASHBURN

CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT ROTTEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON W



Basic refractory brick—pioneered by Grefco—has produced a breakthrough in modern steelmaking. Previously, the advantages of greater steel production at lower cost, brought about by improved operating techniques and greater use of oxygen, were largely offset by the fact that conventional refractories could not withstand the far higher temperatures and stresses that resulted. Only "All-Basic" furnaces (i.e., furnaces completely lined with basic refractory brick) can endure these more punishing production schedules without costly shutdowns for repairs.

Grefco technical and sales service personnel will be glad to provide you with the basic brick exactly tailored to your needs, and with the know-how and experience that make Grefco the industry leader in basic refractories.



GENERAL REFRACTORIES COMPANY

Philadelphia 2, Pa.

A COMPLETE REFRACTORIES SERVICE

cember 15, 1958







ALUMINUM...Design-able

There is probably no one metal with so many favorable characteristics, offering so much to so many applications, as aluminum. It is the *combination* of these characteristics that helps aluminum to improve products, parts, and their production.

As proof of this, consider the staggering growth in usage that this versatile metal has enjoyed just since 1946—over 2 billion pounds more aluminum used in 1957 than in 1946. Consider, too, a few of the properties aluminum offers a designer:

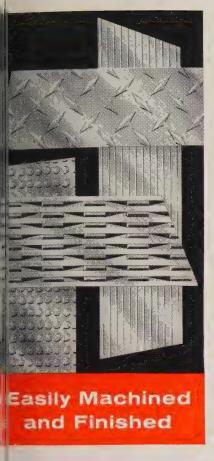
Light Weight—Weighing ½ as much as copper, steel and brass, aluminum offers a big advantage for many products where weight is important. Light weight can also mean lower labor costs, lower costs in shipping, handling and installation. And you can get three times as many parts from a pound of aluminum as from a pound of the other metals.

High Strength—Some aluminum alloys are stronger than structural steel. Aluminum alloys are being used in rugged applications like dump truck bodies, building structurals and highway bridges.

Good Electrical Conductor—One of the main reasons you see more and more aluminum in cable, transformer windings, switches, motors, capacitors, and bus duct is its conductivity. One pound of aluminum is equal electrically to two pounds of copper. This conductivity, plus its light weight, strength, and workability, makes aluminum an important cost-cutter in electrical equipment and systems.

Finish Variety—No other metal can be finished in so many different ways, for so many different effects. You can achieve a brightly-colored or clear finish by anodizing. Aluminum can also be electroplated, painted, porcelainized.

REYNOLDS







because it's versatile

You can finish aluminum by polishing, buffing, embossing, scratch-brushing, spin finishing -by just about any mechanical method. Or you can leave it unfinished, and still have an attractive product.

High Thermal Conductivity—Aluminum conducts heat rapidly and efficiently, thus, it is ideal for air-cooled engines, heat exchange elements, evaporators, cooking utensils. Another characteristic of aluminum is its low emissivity -it retains heat, making it more efficient for air ducts.

Corrosion-Resistance—Aluminum won't rust. But equally important is the fact that aluminum will keep its brightness and strength when handling many chemical agents that attack other metals. This is why so much aluminum piping, jacketing, tanks, vessels, and structurals are used in the chemical and petroleum fields.

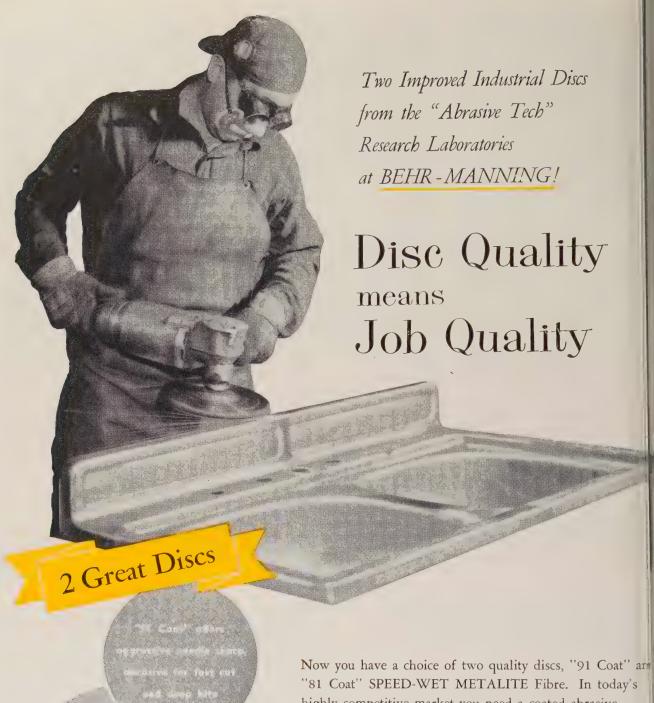
Get the details on all of the characteristics and properties of aluminum and its alloys, and on how it can improve your products, cut your costs. Contact the Reynolds Design and Engineering Service, through your local Reynolds

Reynolds Metals Company, P.O. Box 2346-HL, Richmond 18, Virginia.

Watch Reynolds new TV shows "WALT DISNEY PRESENTS" and "ALL-STAR GOLF" every week on ABC-TV.



ALUMINUM



Rugged "81 Coat"
insures maximum cutting
life and an even
rate of cut

Now you have a choice of two quality discs, "91 Coat" are "81 Coat" SPEED-WET METALITE Fibre. In today's highly competitive market you need a coated abrasive disc designed specifically for the job. BEHR-MANNING invites you to test either or both discs in your plant. Your local BEHR-MANNING Field Engineer will be gloto arrange for test samples or, if you prefer, write to BEHR-MANNING CO., Troy, N. Y., Dept. DT-15.



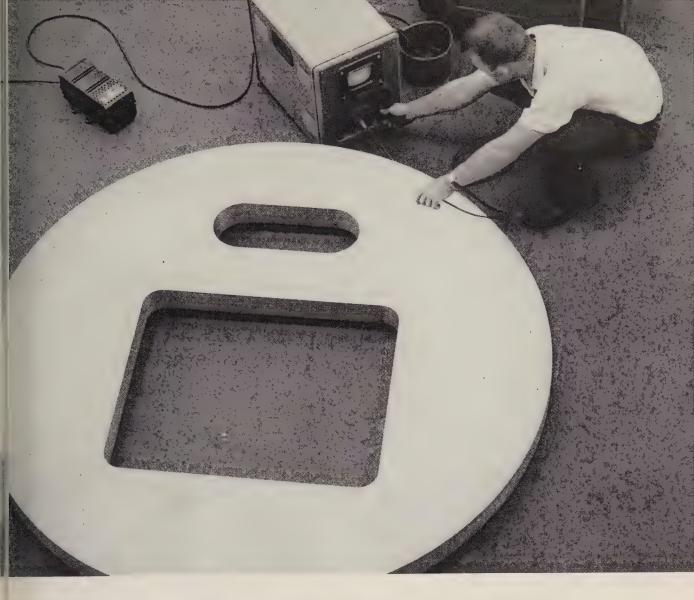
BEHR-MANNING

TROT, NEW YORK

A DIVISION OF NORTON COMPANY

NOR

BEHR-MANNING PRODUCTS: Coated Abrasives • Sharpening Stones • Pressure-Sensitive NORTON PRODUCTS: Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electroch In Canada: Behr-Manning (Canada) Ltd., Brantford. For Export: Norton Behr-Manning Overseas Inc., Troy, N. Y.



"test soundings"

... prove the soundness

of Carlson stainless steel plate

TEAVING THE LEAD" may be the traditional way to keep a boat off the shoals, but modern sound ave instruments do it faster and better. And, for a ry different reason, modern sound wave devices are sed to assure quality stainless steels. Carlson was one the first producers to use ultra-sonic equipment for sting heavy gauge stainless plate.

ok inside and positively determine structural quality. complete report on the results of the test is supplied the customer. By specifying ultra-sonic tested plate, ilders of aircraft components and nuclear equipment in tell in advance that the material will meet their gid requirements.

Ultra-sonic is only one of the many tests used to maintain the high quality of Carlson stainless plate. The final, and most important test, is when you get repeat orders from your customers.

Write, wire or phone for complete information on all Carlson services.

G.O. GARLSON Inc.

Stainless Steels Exclusively

122 Marshalton Road THORNDALE, PENNSYLVANIA District Sales Offices in Principal Cities



KAISER ENGINEERS

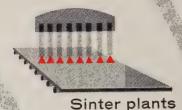
-has designed and built,

-is designing and building,

-will design and build...

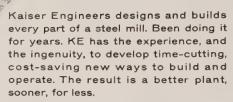


Air pollution control and water treatment





By-products plants



Experience, ingenuity—and a cost-conscious approach. This is what KE can apply to your steel plant expansion program right now. Call or write—today.

Pittsburgh, 330 Grant St., AT 1-7992 New York, 300 Park Ave., PL 9-1100 Oakland, 1924 Broadway, CR 1-2211



Rolling mills



Open hearths



Ore beneficiation and handling



L-D Process plants



Blast furnaces



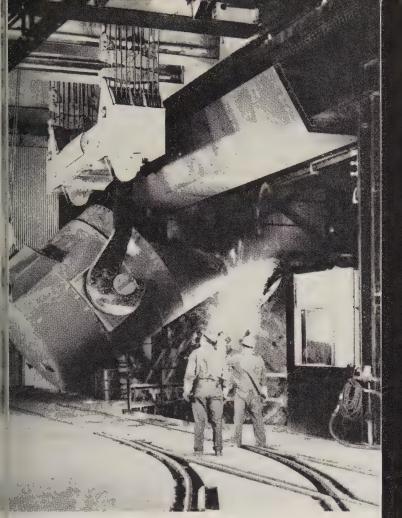
ripe iiiii



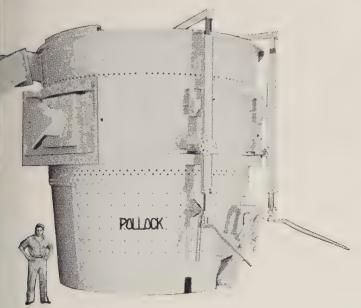
KAISER ENGINEERS

engineers-contractors
Contracting since 1914

Division of Henry J. Kaiser Company • Oakland 12, California • New York, Pittsburgh, Washington Buenos Aires, Calcutta. Dusseldorf, Montreal, Rio de Janeiro, Sydney, Tokyo



i apacity Pollock ladle pouring iron charge into one of the coxygen furnaces at the Aliquippa Works Division of Jones on Steel Corporation.

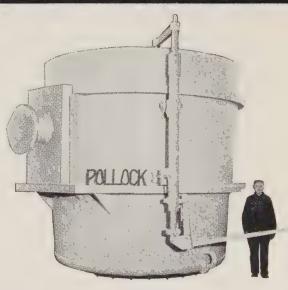


5-ton capacity open hearth ladle built by Pollock is world's largest. It stands 17! 3-1/2 tall.

The Industry's . STANDARD

PALLACK LADLES

Pollock ladles, like the one at left, are engineered for the jobs they do. This one was engineered and built for the Jones & Laughlin Steel Corporation, Aliquippa Works Division, to transport molten iron from the mixer ladle to the new basic oxygen process furnace. Its integral spout eliminates the old-fashioned runner used in most pouring operations, and the feet mounted on the ladle base make the ladle free standing. Pollock also built the ladles to receive the steel from the new furnaces. When you plan new facilities or increased capacity in your present plant, consult the Pollock engineers about your ladles. They'll work with you to develop new highs in efficiency and safety.



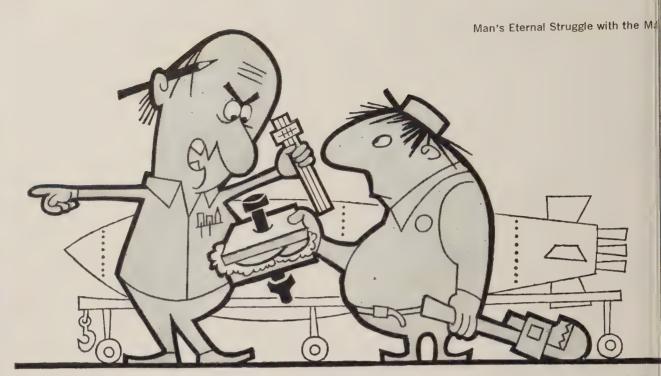
100-ton capacity all-welded electric furnace ladle by Pollock. All-welded construction cuts ladle weight—increases payload.

THE WILLIAM B. POLLOCK COMPANY
YOUNGSTOWN, OHIO

ASSOCIATED IN GREAT BRITAIN WITH ASHMORE, BENSON, PEASE & CO.

STEEL PLATE CONSTRUCTION . ENGINEERS . FABRICATORS . ERECTORS





THE GUIDED MISSILE IS A VAST COMPLEXITY OF SYSTEMS FOR GUIDANCE, TELEMETERING, CONTROL, PROPULSION,

Would you like to know a simple way to build a guided missile?

Sure you would ... and so would everybody else!

Obviously, there isn't any simple way to build a guided missile. And, what's more, there may never be one.

But..

Research and development people just like yours are proving every day that there is a *simpler* way! Constantly, technological improvements are being developed in your own laboratories as well as in laboratories of such organizations as Sciaky.

Sciaky operates the only independent, fully staffed and equipped Research Center dedicated to the development of the resistance welding techniques of fabrication.

That's why the Sciaky Research Center has become a major source to all manufacturers for (1) basic and advanced research, (2) development of experimental tooling and fixturing, (3) assembly of experimental and prototype models, (4) pilot production runs, etc.

Why take less than the full advantage of consulting with Sciaky engineers on your research and development projects. You will receive the full support of (1) the knowledge and experience that has produced almost all the basic technological advances to resistance welding equipment, (2) a complete array of testing and inspection apparatus, and (3) the most unusual collection of the most advanced resistance welding machines of all types, as well as all the other machine shop, fabricating facilities, etc., necessary to a research function of this magnitude.

Write today under your company letterhead for your copy of the facilities brochure describing the Sciaky Research Center in detail. No obligation, of course.



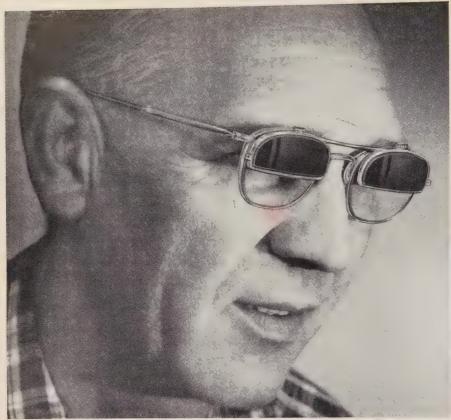








KEYSTONE WIRE FOR INDUSTRY







Eye Protection

SCS202 Lift-Front Goggt



Gives Vision "a Lift" on open Hearth Furnace Work and Welding Operation

AO's NEW LIFT-FRONT ULTRASCOPIC SAFETY SPECTACLE

Here's a new AO-engineered spectacle-type safety goggle (SCS202) featuring a half-eye metal lift-front segment . . . in the popular new ultrascopic shape* . . . and hinged to the top of our F5100 frame. A specially developed friction joint permits the lift section to be raised and lowered repeatedly without loosening. The lift-front can be set in any position and will hold even after constant use.

The SCS202 is regularly fitted with clear, plano Super Armorplate lenses or with prescription lenses when needed.

The lift-front section is available with cobalt blue or Carlenses and can utilize a near point segment for well who need corrected vision for overhead or should high work. This feature is especially practical for unhelmet protection — eliminates the need for spherical plates which have to be changed manually when a change vision range is needed. Your nearest AO Safety Prod Representative can supply you.

*The AO F5100 Series features wider field of vision . . . do braced bridge and many advancements.



Also New! AO Silvabestos† Gloves

Abrasion tests show increased wear resistance up to 168 per cent over conventional asbestos gloves. Recommended for open hearth operations, heat treating, handling hot parts, etc.

Note: AO Sweatbands keep workers cool and comfortable . . . increase efficiency . . . prevent accidents due to blurred vision. Keep a supply of sweatbands on hand.

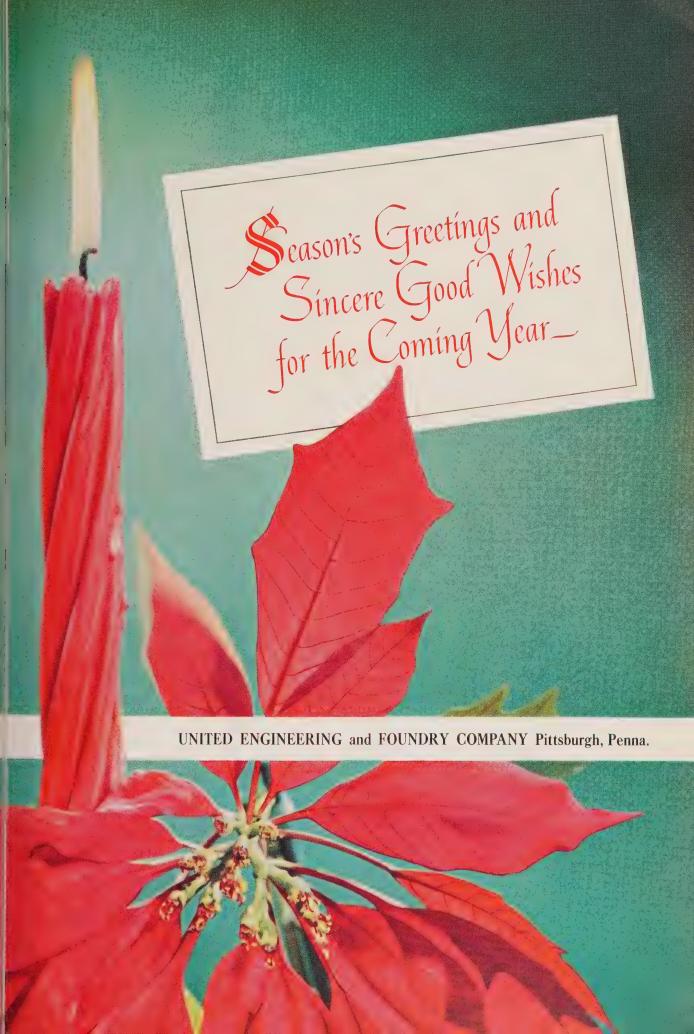
†Registered by Raybestos-Manhattan, Inc.

Always insist on Trademarked Safety Products



1833-1958 • 125 LEADERSHIP YEARS

SOUTHBRIDGE, MASSACHUSETTS
Branches in Principal Cities





Mill Pinions and complete Pinion Stands by Phillie Gear have for many years given dependability plus long service life in the Steel Industry. Engineered Philadelphia Mill Pinions and Pinion Stands are available in even the largest sizes—with prompt deliveries and savings, both in installation costs and in reduced maintenance costs.



* GROUND TOOTH GEARING AVAILABLE

Phillie Gear can quote on your pinion stand requirements in either precision hobbed gearing, or now with ultra-precision hardened and ground tooth gearing. Our new tooth grinding equipment is opening new horizons in rolling mill performance. Write or phone for information.



Send for new 76 page "Gear Book" . . . it is practically a "Treatise" on the subject . . . Use your Business Letterhead when writing.

other philadelphia gears:

- SPUR HELICAL SPUR INTERNAL HELICAL INTERNAL RACKS
- HERRINGBONE WORM NON-METALLIC SPLINE-SHAFTS SPROCKETS
- CONIFLEX-BEVEL SPIRAL BEVEL ZEROL HYPOID INTERMITTENT
- GROUND TOOTH GEARING
 CONTRACT MACHINE WORK

phillie gear®

PHILADELPHIA GEAR CORPORATION

ERIE AVE. & G STREET, PHILADELPHIA 34, PENNA.

Offices in all Principal Cities

INDUSTRIAL GEARS & SPEED REDUCERS + LIMITORQUE VALVE CONTROLS • FLUID MIXERS • FLEXIBLE COUPL!

Virginia Gear & Machine Corp. • Lynchburg, Va.

Metalworking Outlook

December 15, 1958

Price Fighting Tempers Appliance Optimism



Appliance makers expect a 5 or 10 per cent increase in sales next year, but gloom-and-doom statements have rarely been so numerous (Page 83). Reason: The industry is racked with price fighting on the retail level. Even if you are not connected with the appliance business, take note of this classic example of the futility of price warfare. Thirty radio, television, and appliance manufacturers failed in the first ten months this year, 41 in all of 1957. Says one producer: "Chaotic pricing has damaged our integrity."

Metalworkers To Boost Capacity 2.6%

Despite the recession, managers tell us (Page 81) that metalworking will expand its capacity 2.6 per cent in 1959. Spending of U. S. firms for capital items will be at an annual rate of \$30.5 billion next quarter, vs. \$29.9 billion this quarter, and \$32.4 billion in the first quarter of 1958. The great part of the money, of course, will go for the replacement of plant and equipment with more efficient facilities. While 2.6 per cent greater capacity doesn't sound outstanding, it is remarkable because of the number of below-capacity operations in 1958. (The steelmaking rate, for example, will average about 60 per cent.) Significance: We're on the threshold of the soaring sixties, and many firms will be getting ready in 1959. Are you?

World Competition Cuts U. S. Metalworking Export Gain

Rising competition for world trade will hold America's metalworking exports to a 2 per cent gain in 1959 while domestic sales will climb about 9 per cent. The explanation is the increasingly familiar one: We can no longer compete in world markets with many of our products. The French and German plans for world trade next year (Page 96) show they're underpricing us regularly, and their quality is good. Beginning Jan. 1, they'll join Belgium, Luxembourg, Holland, and Italy in the start of a new common market that will pose added competitive threats to U. S. goods.



\$95 Billion in Modernization Needed

American industry has \$95 billion worth of modernization to go, says E. J. Hanley, president of Allegheny Ludlum Steel Corp. He urged that the job

be started quickly to insure American prosperity and the improvement of our ability to compete in world trade. U. S. Steel Corp. Chairman Roger M. Blough warns that we "must face up to the probable fact" that we'll no longer maintain our predominant role in steel production or over-all industrial production because of the rapid inroads of world competition. Our proportion of world steel production dropped from 54 per cent in 1946 to less than 30 per cent in 1958.

Structural Aluminum Begins To Move



Look for aluminum to give steel competition in still another area—structurals (Page 179). Don't be fooled by the fact that aluminum structurals probably account for less than 5 per cent of all aluminum shipments. Potential uses are terrific—in bridges, electric utilities, transportation . . . Steel and other metal producers are studying the implications of yet an-

other development in the light metal. Aluminum makers promise stable prices from now until June 30 (Page 202). One effect will be to squash what little chance remained for steel prices to be boosted at the turn of the year, via higher extra charges.

Good Bet: Steel Merger Case To Go to High Court

Look for Bethlehem Steel Corp. and Youngstown Sheet & Tube Co. to appeal Federal Judge Edward Weinfeld's decision prohibiting their merger. A spokesman says: "We have nothing but time and money to lose by appealing." The Justice Department's first draft of the injunction against Bethlehem and Youngstown was not accepted by the court. It's being rewritten. When the injunction is signed, the companies have 60 days to appeal. The final high court ruling won't come until late 1959 or early 1960.

Patman, SBA Feud over Small Business Act Interpretation

Watch for a red-hot fight on small business to break out in the next Congress. Rep. Wright Patman (D., Tex.) and the Small Business Administration are already hurling charges and countercharges. The issue: SBA's interpretation of the last Congress' Small Business Act, particularly that part relating to investment groups (Page 90).



Wire Fabric Shipments To Hold

Deliveries of welded wire fabric in 1959 are expected to equal tonnages shipped in 1958. However, the industry still operates below capacity, which is probably about 900,000 tons a year. The Wire Reinforcement Institute

says the highway program has been slow to get underway, and its peak demands on the industry won't be felt until about 1960 when it will account for about one-third of the fabric industry's capacity.

Coal Output To Rise 13.8% Next Year

Watch for soft coal production in the U. S. to rise to 455 million tons in 1959, up 13.8 per cent from this year's output. The National Coal Association forecasts that coal consumption will increase 8.1 per cent (to equal production). In 1958 many consumers reduced their coal stockpiles and used more coal than was mined. NCA thinks utilities will take 7.1 per cent more coal in 1959 than they did in 1958; steel will use 36 per cent more; other industrial uses will gain 1.4 per cent. Coal prices will go up some to recover part of the higher wage costs that start Jan. 1, but producers will have to absorb a share of the increase.

How To Measure Your Managers' Performances



Do you have specific ways to measure how your managers are performing? Probably not, because bench marks have been hard to find. William C. Wichman, Hotpoint Co.'s general manager, attacks the problem by pinpointing the manager's accountability. Hotpoint's managers help set their own goals against which their performance is measured (Page 86).

You Can Get More Out of Ceramic Tools

If you're still wondering how to take full advantage of the highly touted ceramic cutting tools, here's some help. A chamferlike land around the cutting edge is almost a must. Ceramics nearly always work better with a negative rake. Those are two of the conclusions based on a two-anda-half year research project just completed. Despite fears that ceramics won't make roughing cuts, the study (Page 128) shows it can be done.



Cheap Atomic Power 15 Years Away

You'll have to wait at least 15 years before you can depend on nuclear reactors as a cheap power source. They still won't be able to compete in areas where hydroelectric power is available. Eight major prototype nuclear plants operate or are under construction in the U. S., producing power at costs ranging from 20 to 50 mills per kw-hr. Coal plant generation costs average 6 to 8 mills per kw-hr. Under development are nuclear superheaters

that will cut costs to 12 to 16 mills. Second-round plants, operating by 1970, will use improved fuel elements to cut costs still more, to 10 to 12 mills. Then, better technology will reduce the cost of fuel elements so nuclear reactors can be competitive with coal plants.

Prospects for Taxes

The next Congress is not likely to raise tax rates. But the U. S. needs more money, and lawmakers will try to get it by: Spreading the tax load wider among taxpayers; eliminating preferential tax devices; and broadening the income base on which taxes are levied. Those three routes are suggested by Rep. Wilbur D. Mills (D., Ark.) As chairman of the tax-writing Ways & Means Committee, he ought to know.



Loose Abrasives Give Fast Finish

Hand buffing is rapidly getting too expensive to use. Among ways to modernize finishing is one that involves immersing parts in fast moving slurries of loose abrasives. There are eight proprietary ways to approach it (Page 150). The slurry-abrasive method doesn't necessarily give a better job than hand polishing, but the quality is good, and it's much cheaper.

Job Outlook Brighter for June Grads

Job prospects for June college graduates are brightening. While companies are signing up for campus interviews at a pace 10 per cent behind last fall's, H. Glenn Ludlow, Michigan University's placement director, is confident the number of companies seeking graduates will equal or exceed the 1957-58 total. Last spring, many firms canceled or curtailed recruiting. No such cutback seems likely during 1959.

Rambler Capacity To Be Raised

American Motors Corp. will increase its manufacturing capacity to more than 400,000 units annually by the start of the 1960 model year. Present capacity is slightly more than 300,000. A \$10 million program calls for no plant construction, but revamping of existing facilities at Milwaukee and Kenosha, Wis. As of Dec. 12, AMC had built 91,000 '59 Ramblers, compared with 44,000 '58s a year ago.



Straws in the Wind

Inland Steel Co. President Joseph L. Block predicts 1959 steel output at 110 million to 116 million ingot tons . . . Reynolds Metals Co. is introducing heavy end aluminum pipe for chemical, petroleum, and farming markets . . . License plates for California cars will be made of aluminum, instead of steel, beginning in 1963 . . . Joy Mfg. Cc. is boosting prices 5 per cent on various types of mining equipment . . . The strike of 7000 at Chrysler Corp.'s Dodge Main plant caused layoffs of nearly another 20,000 last week.



"There's the front end of our production line ... right on time"

Steel right off the truck—ready for your production line . . . your steel supply can be that simple when you rely on Ryerson. You order only the kind and quantity of steel you need—as you need it—and cut costs all along the line.

You reduce investment in equipment as well as materials. You save valuable storage space...reduce

handling costs, scrap loss, taxes, etc. You gain complete flexibility of steel supply without long-term commitments... and assure a ready, steady flow of material to keep production stepping. You're never caught short... you're never overloaded.

Ryerson's size, facilities, staff and service attitude assure dependable delivery to meet regular schedules or to handle special short-run orders. Whatever you need, this unsurpassed source of Certified Quality steel is at your finger tips. Phone your nearby Ryerson plant today.



RYERSON STEEL

Member of the Than Steel Family

Principal Products: Carbon, alloy and stainless steel—bars, structurals, plates, sheets, tubing—aluminum, industrial plastics, metalworking machinery, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE • CINCINNATI • CLEVELAND

DETROIT • PITTSBURGH • BUFFALO • INDIANAPOLIS • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

December 15, 1958

How Bright Wire Fabricators Save and Make Money

with DSC-Portsmouth Long Production Ru



One user summed up LPR advantages this way, "One big run on your LPR coils and we suddenly discovered after all our wire-working years, we had been using teacups instead of buckets for baling out our leaky production boat!"

WHAT OTHER TYPICAL USERS REPORT—

- "We cut our unloading time in half."
- "We reduced our coil storage space 15%."
- "We quit using small-coil storage racks."
- "Our man-hour costs dropped 20%."
- "No more returnable gimmicks for us."
- "We cut our scrap losses by 90%."
- "In our cutting, straightening and flattening department, one operator now runs four machines. Best previously, three machines."





See how compactly you can stack over 13 tons of LPR of

PERFORMANCE-PROVED PRODUCTION MATERIAL PLUS A SELF-CONTAINED COST REDUCTION SYSTEM

That describes DSC Bright Wire in LPR coils. He about exploring the possibilities in your own operations? Just call your nearest DSC "Rep" or write use Detroit. Either way, your inquiry will get immediaction . . . whether your interest is Bright Wire or ot DSC products and services. Hear from you . . . soon DSC products and services.

Happy Holidays and a Big New Year for All



GENERAL SALES OFFICE, DETROIT 9, MICHIGAN CUSTOMER "REP" OFFICES:

Charlotte, N. C., Chicago, Cincinnati, Cleveland, Columbus, Ohio, Dayton, Ohio, Detroit, Grand Rapids, Mich., Hamden (New Haven), Conn., Houston, Texas, Indianapolis, Jackson, Mich., Louisville, Ky., Milwaukee, Wis., New York City, Rochester, N. Y., St. Louis, Toledo, Worcester, Mass.

The PROOF of DSC STEEL is in its PERFORMANCE on Your Job

DSC PRODUCTS: Coke . . . Coal Chemicals . . . Pig Iron . . . Basic Open Hearth Steel Ingots, Blooms, Slabs, Billets, Rods . . . HR and CR Sheet and Strip . . . Flat CR Spring Steel . . . Manufacturers' and H.C. Specialty Wire . . . Welded Wire Fabric



Should Top Brass Help Sell?

One of our favorite metalworking presidents heads up a successful, multimillion dollar company with a well-organized and well-managed sales organization.

He could sit back in his big, soft chair and press buttons to get endless reports from research, engineering, production, marketing, and sales as the bases for guiding his company's destiny.

But he doesn't. Sure, he gets reports, but he also gets out of his big, soft chair and into the field. He contacts customers and prospects with the No. 1 objective of getting more business for his company.

He does not travel so he can live off a fat expense account, or take over work that should be done by the sales department.

He does it for two reasons:

- 1. To cultivate and maintain top-level contacts that are not readily accessible to his sales people.
- 2. To get first-hand facts as the bases for making better decisions for the company.

Here are some of the many collateral benefits from his work in the field:

It helps him find out personally whether his company's products are being well received, whether changing trends call for new or improved products, whether more research and plant capacity are needed.

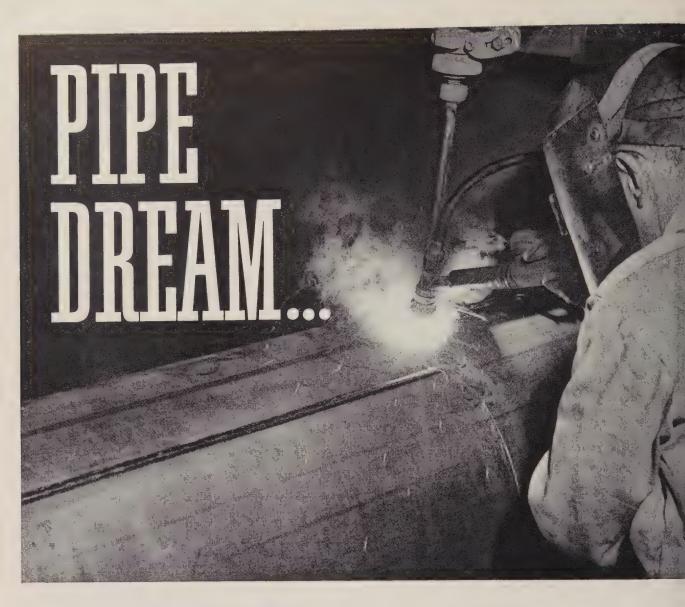
It helps to build morale of the sales organization since better customer relations at the top make it easier for salesmen to get orders.

It helps build his own morale and make him a better executive. Unlike many sit-at-home executives who are softened by prosperity and often shielded from the facts, he does not lose his perspective—or get lonesome! He can decisively appraise the recommendations of his associates and hold his ground in a board meeting.

We think that top brass should sell the way our friend does.

EDITOR-IN-CHIEF

Lawin H. Such



... Unionarc Welding saves \$7000 on one production run

UNIONARC Welding—LINDE's new electric welding method for steel—increased production by 300% and saved a western pipe mill \$7000 on a single run of steel pipe. Replacing covered electrode methods, UNIONARC Welding is expected to save this company \$150,000 a year.

UNIONARC Welding uses a continuously-fed wire electrode, magnetically coated with flux and shielded with carbon dioxide gas. It has three times the speed and weld penetration of covered electrode welding. And UNIONARC Welding gives you "finished", X-ray quality welds and low hydrogen deposits—in all welding positions.

See for yourself—ask your nearest LINDE representative to prove that UNIONARC Welding slashes time and labor costs over conventional methods. Call your local LINDE office today! Or write Box ST 123, LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. Offices in other principal cities. In Canada: Linde Company, Division of Union Carbide Canada Limited.



37.1% of Metalworking Plants Will Expand in '59



Of those:

9.5% Will Build New Plants

34.5% Will Build Additions

70.1% Will Buy Equipment

Bethlehem Steel Corp.

Metalworking Will Up Capacity 2.6%

PRODUCTION CAPACITY of U. S. metalworking plants will be hiked 2.6 per cent next year—despite a lot of excess space and equipment in many industries now. Reason: Alert managers are preparing for the "soaring sixties." In some places outside metalworking, the upswing is already getting underway (see table on next page).

STEEL asked the general managers of 7500 metalworking plants for their 1959 expansion plans. Answer: Nearly 4 of 10 will take on new capacity.

• Paradox—The steel industry is operating at 75.5 per cent of capacity this week and will average only about 60 for the year; the

aluminum industry is producing at about 85 per cent of capacity. Yet 38.2 per cent of the primary metals plants will expand in 1959. The machine tool industry is operating under 40 per cent of capacity, and its prospects for next year aren't much better. But the machinery (except electrical) group, in which machine tools are a major factor, will boost its capacity 2.2 per cent next year, the survey reveals.

Seasoned industry observers have a logical explanation for the paradox. They believe that metalworking management has taken a good look at long range prospects, and the future appears to be so good that they want to get ready before orders start pouring in.

- Doldrums—But the survey results don't signal an expansion boom—far from it. Metalworking planned to hoist capacity about 3.5 per cent this year and nearly 5.6 per cent in 1957. Few metalworking industries will equal their 1958 expansion rates; many will fall far below that level. For example, electrical machinery producers plan a 3.2 per cent increase in 1959, vs. about 6 per cent this year.
- Bright Side—Figures on total 1959 spending for plant and equipment (including purchases for replacement) make more pleasant reading. Industry's campaign to lower production costs is contributing to the upswing found by the

In Capital Spending, a Slow Turn Upward

(Billions of dollars, seasonally adjusted annual rates)

(billions of dollars, seasonally	1959 JanMar.*		1958 JanMar.	Year
Manufacturing	11.06	10.79	13.20	11.50
Durable goods industries ,	5.35	5.11	6.58	5.54
Primary iron & steel	1.01	1.01	1.52	1.22
Primary nonferrous metals	0.34	0.30	0.68	0.43
Electrical machinery & equipment	0.42	0.40	0.52	0.45
Machinery, except electrical	0.85	0.90	1.11	0.95
Motor vehicles & equipment	0.55	0.52	0.66	0.58
Transportation equipment, except motor vehicles	0.37	0.32	0.43	0.36
Nondurable goods industries	5.71	5.68	6.62	5.96
Mining	0.84	0.91	1.00	0.93
Railroads	0.54	0.59	1.02	0.76
Transportation, other than rail	1.72	1.64	1.69	1.51
Public utilities	6.41	6.32	5.87	6.11
Commercial & other	9.94	9.68	9.63	9.74
Totals	30.51	29.93	32.41	30.53

Source: Department of Commerce, Securities & Exchange Commission.

*Estimated.

Securities & Exchange Commission and the Department of Commerce in their latest survey. It indicates that American industry will invest in plant and equipment at a \$30.51 billion annual rate during 1959's first quarter. That compares with a \$29.93 billion rate during the current quarter.

• Lag by Comparison—But the estimate for 1959's first period is

nearly 6 per cent below the rate in the first quarter of this year and slightly below the 1958 average. That puts it 17 per cent below the record set in 1957. Manufacturing industries accounted for the bulk of the decline.

• Who'll Spend Most—Public utilities continue to be the strong point; their first quarter (1959) spending will be 5 per cent above

the 1958 rate. Nonrail transportation and commercial organization are showing significant gains. The nondurable goods industries will boost their outlays slightly, predict the SEC-Commerce survey.

• Metalworking's Plans—The durable goods industries will spend 4.1 per cent more next quarter than they did during the current periodo But that will be nearly 20 per cent below the rate during the first quarter of this year.

Primary producers of nonferroumetals will spend only half as much during next year's first period as they did in the first three months of this year. Nonelectrical machinery makers will spend 23 per centless, and the primary steel and irongroup will register a 34 per centlepop.

Here's a comparison of annual rates for the durable goods industries:

1958		٠	٠		.\$5.54	billion
1957					.\$8.02	billion
1956		٠			.\$7.62	billion

The durable goods industries his bottom in the second half of this year. All categories, except none electrical machinery, will spend more next quarter than this quarter (see table).

• Wrapup—Both Steel's survey and the SEC-Commerce Department forecast indicate these threshings: 1. The rate of plant and equipment investment is at the threshold of a lengthy uptrend. 22. The upswing will start slowly burgather speed during the second hal of next year. 3. Alert manager ment is not waiting for near cappacity operations before loosening its purse strings. Rather, it is adopting a policy of long range prepared ness. Metalworking will be ready for the boom years.

Mobiles To Get Appliances

Philco Corp., Philadelphia, has started manufacture of appliances for the mobile home industry. John L. Utz, general manager of special market planning, heads the department handling this activity. Products installed in mobile homes will have the same warranties as those used in conventional homes.

Factory Shipments of Electric Appliances



	1959	1958	1957
Air Conditioners	1,856,000	1,600,000	1,750,000
Automatic & Semi- Automatic Washers	2,800,000	2,650,000	2,782,000
Dishwashers	428,600	386,100	390,000
Electric Dryers	900,000	800,000	881,000
Home Freezers	1,077,500	1,036,000	925,000
Ironers	25,000	30,000	44,000
Ranges (including built-ins)	1,265,000	1,183,000	1,385,000
Refrigerators	3,412,000	3,075,000	3,350,000
Washer-Dryers	200,000	168,000	179,000
Wringer Washers	800,000	850,000	903,000

1957 statistics from manufacturers' associations. STEEL's estimates for 1958 and 1959 are based on interviews with manufacturers and associations.

Appliance Makers See 5-10% Upturn

THE MAJOR APPLIANCE industry is approaching 1959 with cautious optimism. Industry leaders anticipate a 5 to 10 per cent increase over 1958 sales. Some companies are shooting for over-all gains of as much as 35 per cent. Goals for specific lines are up as much as 50 per cent.

Price cutting and low profit margins worry appliance executives as much as unit sales. "Chaotic pricing has damaged our integrity as an industry in the customer's eyes," says a sales promotion manager. Judson S. Sayre, president, Norge Div., Borg-Warner Corp., Chicago, asks: "With the stimulating upturn in business, will companies rush into more production to get a larger share of the market, and produce, through intemperate overproduction, more inventory gluts, more price dumps and frenzied selling, new consumer confusion, and, again, a self-induced business recession?"

• Profits Slim—Price cutting has nipped profits. "What good does it do to sell a million appliances if you can't make a profit on them?" ponders a retailer. Discounting, up to 25 per cent off list, is slashing profits at all levels of distribution, particularly at the retail level. The National Appliance & Radio-TV Dealers Association reports dealers operated on a 1.6 per cent investment return last year. They don't believe '58 will be much better.

There has never been such a wide gap between our capacity to produce and our willingness and ability to sell creatively, admits H. L. Travis, vice president-sales, Kelvinator Div., American Motors Corp. "Unless we can successfully combat price cutting so that everyone in the picture can make a fair profit and return on his investment, we will have to change our way of doing business," declares another industry spokesman.

Dun & Bradstreet lists 30 fail-

ures among radio, TV, and appliance manufacturers during the first ten months of this year (liabilities totaled \$3,546,000). There were 41 failures in all of 1957 (liabilities, \$8,511,000).

• Sales Outlook—Since the appliance upturn started in July, refrigerators, freezers, laundry equipment, and some ranges have been doing well. Still disappointing among the more popular items are clothes dryers, food waste disposers, and dishwashers.

Fred Maytag II, president, Maytag Co., Newton, Iowa, says: "We have seen a temporary setback to the appliance industry. Our recession has definitely bottomed out, and sales are moving upward."

Market saturation is over 85 per cent for radios, refrigerators, TV, all ranges (electric ranges: 31.5 per cent), and washers. New modes of living (increased use of frozen foods, for example) and changing con-

December 15. 1958

sumer wants (larger, more versatile units, portable TV) should boost the replacement market. Saturation of less than 20 per cent for air conditioners, clothes dryers, disposals, freezers, and water heaters points up a great sales potential.

Expectations that 1959 will top a boom year like 1955 are mixed. Only air conditioning producers predict a big jump over that year (220 per cent, says one maker). Another bright spot will be home laundry appliances, which the American Home Laundry Manufacturers' Association says will have their third best year in history (exceeded by 1956 and 1955).

- Trade-ins—An increasing number of firms are promoting tradeins as a selling tool. "Used appliances are destined to become an American tradition as used cars are today," states D. C. Bowell, head of used product merchandising, Frigidaire Div. of General Motors Corp. "There was no recession in reconditioned used appliances," he continues. "Frigidaire dealers equipped to handle reconditioned appliance sales could not get enough used products to supply demand." Many in the industry recognize the increasing importance of used appliances but question their potential as a major market factor.
- Built-ins Built-in appliances have held up well in the depressed market. Sales of electric ranges are up about 20 per cent, refrigerators perhaps as much as 25 per cent. One major producer reports sales in this category totaled 31 per cent of production last year and expects the figure to reach 38 per cent this year. Other equipment of this type has not snared a significant portion of the market.

The increasingly popular practice of including major appliances in new homes (1.2 million will be built in 1959) has brightened the future of built-ins. Some will also be furnished with free standing appliances.

• Color — Color appliances have not caught on as well as anticipated. They are sliding along at about 5 per cent of the market. But the built-in boom is a boon to color. The adaptation of built-in appliances to cabinet colors in a kitchen

is easier than it is with free standing appliances where the match is a more serious problem. It is generally agreed that color will gain substantially in the next few years.

• Prices—Few manufacturers plan price increases next year. But increased excise taxes will result in some hikes. (Not all makers will absorb them.)

The over-all appliance picture was not as bad this year as factory shipments may indicate. Producers went into 1958 with heavy inventories and production geared for a 10 per cent increase over the 1957 performance. Anticipated sales did not develop, and manufacturers' inventories kept dealer stocks adequate. Result: Reduced work at plants.

• Gas—The gas industry is preparing to battle with the electric industry for the home appliance field. The Gas Appliance Manufacturers Association has tripled its ad budget. It will spend a record \$30 million for advertising and promotion next year.

The gas refrigerator, once thought dead, is on the rebound. All-gas kitchens are being pushed. Even plug-in gas cooking burners, percolators, air conditioners, freezers, frying pans, and casseroles are in the works.



AN ULTRASONIC SEAMWELDER, being developed by Westinghouse Electric Corp., is shown completing a weld between two 10-mil thick aluminum straps. The aluminum sheets pass through two wheels vibrating at 20,000 cps. The oxide coating is broken and the metal lattices on the surfaces weld themselves by a kneading action

Chamber Experts See Moderate '59

THE ANNUAL forecasting session of the U. S. Chamber of Commerce last week was pretty tame. The chamber's panelists took as moderate view of 1959.

- GNP Gross national products predicted Dr. Emerson Schmidt, the chamber's director of economic research, will rise about 5 per cent, to \$470 billion-\$480 billion.
- Capital Spending—"It is difficult to attain full prosperity without as strong capital goods boom," noted Dr. Schmidt. With the exception of William Dooly of Associated General Contractors, no one predicted much of an upturn (see Page 81). Planning for new projects will expand the last half of the year to hold industrial construction to within 10 per cent of this year's \$2.5 billion, he said.
- Housing—This category remains questionable because of the possibility of tighter credit and higher interest rates next year. Mr. Dooly projects housing starts at better than 1.8 million, with apartments continuing to add strength to the private construction category.
- Autos—Harlan Hadley, Automobile Manufacturers Association forecast that 5.5 million cars will be made in the next calendar year:
- Durables—George Eaton, executive vice president, National Tool & Die Manufacturers, sees few model changes next year in consumer durables, including autose and appliances.
- Tool & Die Shops—For his ownfindustry, Mr. Eaton foresaw a 157 per cent hike in 1959, which would still be "depressed." Such a gain would leave it 15 per cent away from 1957's level, which he called only a "reasonably good year."
- Steel—Pessimists put steel production at 105 million tons next; year; optimists go as high as 1200 million tons, said William Story of the Institute of Scrap Iron & Steel.
- Railroads—Railroads can be expected to come into the market after their "bleak" orders of 1958.

All panelists agreed prices will rise next year—but not too much.



Jones & Laughlin Steel Corp.

What Memphis Case Means

eversal of the decision by the Supreme Court may encourige expansion of natural gas pipelines. Upturn in line pipe orders and gas drilling equipment predicted for 1959

N REVERSING the Memphis desion last week, the Supreme Court we steelmakers a big Christmas resent and assured them a haper new year.

They can count on a resurgence line pipe demand in 1959 as natral gas companies resume expanon programs that were shelved 13

onths ago.

"Our shipments will probably up 25 per cent next year," says line pipe producer. A valve manfacturer predicts a 15 per cent gain bookings and a 10 per cent spurt shipments. Plate mills think the ourt's decision may mean a milon tons to them soon.

How Trouble Began—In Novemer, 1957, a lower court threw the atural gas industry for a loss by uling that transmission companies buldn't raise their rates without rst obtaining the consent of all leir customers. (Previously, they ad been required only to give sers six months' notice. Increases ere subject to review by the Fedral Power Commission.)

Although demand for gas was reat, pipeline people lost much of heir zest for expansion. Under the new rules, they'd sometimes find that one city of five they served would block an increase after the others had approved it. Banks decided pipelines were a poor risk. Results: At least four companies dropped plans for \$222 million of construction. Three steelmakers had 250,000 tons of line pipe wiped off their books. Rockwell Mfg. Co., Pittsburgh, lost half its backlog of valves and meters.

• Shipments Plummet—The combined forces of law and recession have pulled line pipe shipments down from last year's record high of 4.2 million tons to this year's 2.6 million (estimated). The outlook for 1959 is encouraging, but few producers think more than half the lost ground will be recovered. A 3.4-million-ton year would be better than the average since 1949 (3.2 million).

In commenting on the decision, E. B. Germany, president of Lone Star Steel Co., said the Supreme Court's action should result in increased demand for line pipe and oil country goods and "rejuvenate" the whole natural gas industry. The full impact of the decision may

be delayed until transmission companies obtain new financing for their postponed or canceled projects, he added.

Although Republic Steel Corp. believes reversal of the Memphis decision will stimulate new pipeline projects, it expects no immediate benefits. Its Gadsden, Ala., mill is running at capacity on large diameter pipe and has a big backlog. Speaking for A. O. Smith Corp., Milwaukee, H. F. Detrick, vice president, declares: "We fully expect that our line pipe business will be significantly better in 1959 than it was in 1958." Inland Steel Co. foresees "materially increased demand" for plates.

• Oil Country Pickup?—Manufacturers of drill pipe, tubing, and casing hope the revival of interest in pipeline programs will mean better business for them, too. They believe gas producers will have to drill more wells to supply their expanding markets. Drillers' inventories of the popular sizes of tubing and casing are thought to be abnormally low.

Some steel executives think (off the record) that some market observers have exaggerated the significance of the Memphis decision. By way of illustration, one mill reveals that it lost about 150,000 tons of line pipe right after the decision was announced. "But six months later, one of the companies that had canceled gave us an order for 100,000 tons," says a sales official.

Line pipe producers don't think any expansion program that's started from scratch will help them much in 1959. They point out that the preliminaries (negotiating loans, obtaining a gas supply, procuring pipe, and acquiring rights of way) require at least six months.

• Psychological Impact — If the Memphis decision's reversal has any immediate effect, it will be to confirm buying intentions of pipe users. They'll issue releases against orders that were previously regarded as conditional. What's more, they'll release tonnage unrelated to the Memphis case that was being held up by their pessimism.

How fast line pipe bookings improve will depend largely on the FPC's diligence in processing a

huge backlog of rate cases.

GE's Eight Key Result Areas

1. Profitability

It is the ultimate measure, normally considered on residual income (net income less a capital charge) and return on investment.

2. Market Position

It reflects not only share of market but compares one field with another—as gas, vs. electric.

3. Productivity

It measures efficiency of human, capital, and material resources.

4. Product Leadership

This is the key measurement. It compares quality with that of competitive products. Timing of new products and product improvements also counts.

5. Personnel

This measurement includes projections of management demands and the supply of promotable people.

6. Employee Attitude

It is measurable to a degree by attitude surveys and individual productivity.

7. Public Responsibility

This factor is concerned with the public's expectations of corporate performance.

8. Balance Between Short and Long Range Goals

The objective is to evaluate the effect of today's decisions on tomorrow's activities.

Here's a Way To Measur

HOTPOINT CO. gages its managers by comparing actual with planned performance. Two valuable functions are served: 1. An individual's development is analyzed and implemented. 2. Current activities are adjusted to established goals.

• Foundation—The key to the program is the management philosophy of William C. Wichman, Hotpoint's general manager and a vice president of General Electric Co., the parent firm. "Measuring," he emphasizes, "means more than historical analysis. It implies doing something about that analysis."

The basic objective of the program is to get each manager to enter his goals and accomplishments on an accountability sheet, so that he and his boss can periodically discuss his total performance.

• Method — GE has established

"Eight Key Result Areas" (see exhibit) to measure the performance and trends of its diversified organization. Those areas are the framework for Hotpoint's appraisal program.

GE's chairman, Ralph Cordiner, stresses that decentralization requires measurement of managers' performance. A man is rewarded for a good record, displaced if he has a poor one.

The two major factors in Hotpoint's approach are:

• 1. Setting Individual Goals—The man must thoroughly know the organization's goals, the business climate, and any specific situations affecting the company, Mr. Wichman explains. When the manager and the man (who may also be a manager) agree on the characteristics and needs of the situation, they can jointly set goals for the

man's particular position. The mager will know—because it's job—that the goals are in harmon with those of other members of torganizations.

• 2. Delegation and Acceptance Once the goals are determined, I man and his superior discuss the authority, facilities, manpower, at time required to attain the need results, determine how they will measured, and define the mannand timing of reports. For the aperior, it means releasing authority For the man, it means accepting accountability.

These "man-manager" relationships are developed at every management level, says Mr. Wichman When framing his position guideach man writes down his specific goals in each of the result areas, do this, he makes assumptions about the situation, the resources here.



Hotpoint's William Wichman talks of ways to judge a manager

Executive Ability

need, and his relationships with others (where team effort is involved).

- . Teamwork—In team assignments, he man and his superior agree on now to measure the man's contribution to the project. Leadership in team effort may shift. Take, for example, a project involving a design change and internal substitution of a less costly component. The team may include men from advance engineering, design engineerng, manufacturing engineering, product planning, and accounting. Initial leadership may rest with the advance engineer, then shift to the design engineer, and so on as the project progresses.
- Reports Periodically, the man reports to his superior and compares his results with standards, goals, or budgets. Deviations are

explained, and goals and plans may be modified. The man makes two kinds of measurements in his report:

1. Primary—information directly affecting his accountability. Example: A salesman's primary measurement will probably relate to market position, volume attained, vs. potential, and the cost of getting that volume.

2. Secondary and personal—measurements the individual makes to help himself do a better job. The salesman might want to discuss with his superior the number of calls he makes per day, time spent per call, or contacts in a customer's organization.

Stresses Mr. Wichman: All managers must see that individual plans and goals combine to produce balanced results in the eight key areas.

• How You Can Do It-Mr. Wich-

man suggests this procedure to help you bridge the gap between operational measurements and appraisal of individual performance:

• One — Consider your business right now—it has certain potentials based on the state of your facilities, designs, products, organization. To get the best possible performance:

Analyze short range opportunities in relation to available business, competition, costs, prices.

Establish an integrated set of plans supported by budgets that are geared to improve performance in the business climate.

Set up a budget and measurement structure that permits operational measurements to filter down through the organization so that they will ultimately apply to a minimum number of people.

• Two—Think of improving your business as separate from running it as it now exists.

Separated to a practical degree, improvement programs can be considered at will in the short range. The risk and potential of each project must be evaluated and aggressively followed in terms of its budget of time, cost, and results.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, Steel, Penton Bldg., Cleveland 13, Ohio.

More Americans Go West

Looking for growing areas? If so, turn to the West.

The Commerce Department reports six of the nation's ten fastest growing states are in that section. Three are in the South and one in the North Central States.

The westward trend has resulted in a 29.7 per cent increase in population of western states since 1950, from 19.6 million to 25.4 million. Nevada's growth has been 67 per cent, Arizona's 52 per cent.

The South registered the greatest total gain—an increase of 6.6 million in eight years, or 14.1 per cent. Florida gained 60 per cent.

Other areas are sharing in the nation's dynamic expansion. The North Central States have gained 14.7 per cent—6,548,000 more people. The Northeast States added 3.6 million, an advance of 9 per cent.

Executive Pay Static

Reduced bonuses have offset normal salary increases, shows AMA Survey of 3500 Companies

THE AVERAGE top executive made no gains in total compensation last year, says the American Management Association which surveyed more than 3500 companies in the U. S. and Canada.

Base salaries accounted for 80 per cent of compensation, bonuses 14 per cent, and retirement programs 6 per cent. About 35 per cent of the reporting companies had supplementary forms of compensation, such as stock options and stock purchase plans. Coverage: Some 65 per cent of the large companies and 12 per cent of small companies.

• Lower Bonus Payments — The survey disclosed that normal salary increases were offset by lower bonus payments, even though the management task was more difficult in a recession year. Bonuses varied more directly with profits than did base salaries. Bonuses were down to 36 per cent of base salary, compared with 45 per cent in more profitable years.

Sales and revenues shown by the survey were generally favorable, although the rate of increase was about one-fourth lower than the previous year and in many cases did not carry over into profits. Seven out of ten companies reported sales increases, but only half had profit increases.

Steel Payroll Up

Employment and total payroll of employees engaged in producing and marketing steel increased during October, says the American Iron & Steel Institute. Hourly and salaried combined payroll in 94.9 per cent of the industry rose from \$294,277,422 in September to \$325,307,323 in October, a gain of about \$32 million. The October, 1957, total was \$330,029,828.

Totals for the first ten months of 1958: Employment, 519,105; payroll, \$2,736,445; average hourly wage, \$3.155 (with an additional 33 cents in fringe benefits) average workweek, 34.9 hours.



OCDM Saves Tool Reserve

A NEW program for using National Industrial Equipment Reserve machine tools in schools may go a long way toward solving Uncle Sam's tool problems.

Anticipating a Congress prone to save money in inconspicuous places, the Office of Civil & Defense Mobilization has moved to prevent a recurrence of last session's battle over funds for the National Industrial Equipment Reserve (NIER).

• New Loan Program—A year of quiet pressure by OCDM paid off last week in the form of an order from the Defense Department to loan 61 machine tools from NIER to the North Carolina Board Education. (They're for the Forsy County Industrial Education Ceter at Winston-Salem.) It was a termined that the institution counot have obtained the tools through the Health, Education & Welfa Department's program for dispoing of surplus tools to school (NIER tools are not surplus by a means; they will form the backbone of any mobilization efficienced to meet an emergency.)

The loan program is limited this one instance until "the buare worked out," says an OCE official. He guesses a year will needed to see if the plan is won

ble; then more loans can be exsected from the NIER.

Special Criteria — The program nust meet requirements of P.L. 883 passed in 1958: 1. Tool loans will contribute materially to national lefense." 2. The tools will be properly maintained" and returned o the government without cost.

Applicants for tools have to be a nonprofit educational institution" nd must show that funds are availble for financing shipping costs, quipment installation, instructors' alaries, power, heat, light, equipnent maintenance, supplies, ll other expenses involved." tructors must be qualified, and the ools must be returned on request. Government inspectors will probibly check the tools semiannually o see if they are being maintained and used correctly.

• Accomplishment — The program uts down NIER storage costs, gets hem maintained free of charge, outs them to constructive use, and lisperses them, sums up the OCDM

NIER tools are now in two warenouses, one in a prime eastern arget area. Plans for their dispersal to four or five sites are in he works, but the school loan program does that job even better.

OCDM is a little concerned about being swamped with applications or NIER tools, so the agency emchasizes the program conflicts in 10 way with the donation plan of he Health, Education & Welfare Department—in fact, it is probably better because the schools don't ace the prospect of having the tools ecalled by Uncle Sam.

The Winston-Salem school was picked for the pilot loan because raining is needed in the area: A nissile plant there reported its expansion has been held back because of a shortage of skilled workers.

Display To Tour Nation

A mobile display, designed to show businessmen, engineers, and ndustrial production supervisors a variety of motors and drive products in operation, will go on an 18nonth nationwide tour starting this month.

The unit is a promotion of Reliance Electric & Engineering Co.,

Cleveland.

Ohio May Get SUB

Ohio Supreme Court "sighted SUB, sank same." New law to permit payment of Supplemental Unemployment Benefits may be proposed when the Ohio legislature convenes Jan. 5

ODDS ARE that Ohio's legislature will allow laid-off workers to collect Supplemental Unemployment Benefits. An amendment to the state law may come this session. Expansion of state jobless pay may also be an issue.

The Ohio Supreme Court's decision against simultaneous payments of SUB to people collecting unemployment compensation affects more than 200,000 workers covered by union negotiated SUB programs in the steel, automotive, rubber, glass, and other industries in Ohio.

• Test Case—The issue was carried to the Supreme Court in a friendly "test case" brought by the United Steelworkers against U. S. Steel Corp., Republic Steel Corp., Jones & Laughlin Steel Corp., and Youngstown Sheet & Tube Co. James R. Tichenor, administrator of the Ohio Bureau of Unemployment Compensation, was also a party to the action. He first banned SUB payments.

The companies sided with the union. They wanted to pay SUB. (A \$20 million fund has been built up since August, 1956.) Terms of the steel-USW agreements provided that laid-off workers would receive money from the fund, plus state unemployment compensation. The two combined would equal about 65 per cent of takehome pay.

As the state law now reads, any person must report income received during his period of layoff. amount will be deducted from his unemployment compensation payment for that week. In its ruling at Columbus, the court said that SUB payments are remuneration for personal services and should be deducted. The action reversed the ruling by two lower courts.

 Positions Taken—Steel companies are deferring action until they can study the court's 5 to 2 decision.

The Ohio Chamber of Commerce has announced that unless there is a change in its board's policy, chamber representatives will present arguments against incorporation of SUB provisions into the Ohio

Sen. Frank W. King (D., Lucas County), majority leader in the state Senate, said that he is sure the law will be amended to legalize SUB and also to liberalize unemployment compensation benefits. Senator King recalled that the legislature didn't bring in a bill to permit SUB payments last June. Labor leaders then figured that the SUB case would be won in the Supreme Court. Now, with a Democratic governor and legislature, the SUB bill will be pushed for passage soon after the solons convene Jan.

• Side Issues—Senator King also announced that state legislators may call for increasing the unemployment benefit period to 39 weeks and recommend upping the state payments to 50 per cent of a worker's weekly wage. He said that the Bureau of Employment Security in the U.S. Labor Department previously recommended those changes on a national level. (The maximum in Ohio is \$39 a week for a claimant with two dependents under 18. The benefit period has been increased temporarily from 26 to 39 weeks for those on layoff. The temporary law expires Apr. 4, 1959.)

Except for those who served in the armed forces, unemployment compensation payments are entirely subsidized by Ohio employers. (Administrative costs are paid by the federal government.) Employers entering the state plan pay into the Unemployment Compensation Trust Fund at a basic rate of 2.7 per cent of all taxable wages up to \$3000 per calendar year (\$81) for each eligible employee. Within four years, a reduced rate is possible if usage, based on layoffs, is



Patman Challenges SBA

REP. WRIGHT PATMAN (D., Tex.), chairman of the Small Business Committee, has again brought his quarrel with the Small Business Administration into the open.

This time he claims SBA has "vetoed" the Small Business Investment Act (STEEL, Sept. 15, p. 106) with its regulations governing the formation of investment firms designed to loan money to small businesses.

The congressman is particularly upset about the 5 per cent interest to be charged firms borrowing money from Uncle Sam. Generally, he indicates the regulations tend to favor big lenders. Example cited: SBA's plan to charter investment companies first. They don't require any funds from the government.

Representative Patman has long favored direct government ownership in small firms (through stock) rather than indirect loans. As small business' champion on Capitol Hill, he will no doubt go into the subject extensively this week when he begins Joint Economic Committee hearings on the relation of prices to economic growth. SBA's administrator, Wendell Barnes, denies Mr. Patman's charges. Outlook: A stormy time for Mr. Barnes next year when the Small Business Committee checks to see how well the Investment Act is working.

New Fight Against Highway Fund

Look for Sen. Albert Gore (D., Tenn.), chairman of the roads subcommittee, to lead a successful fight to kill the Highway Trust Fund in the next session. (Federal highway expenditures have been financed out of a trust fund built principally from gasoline taxes.)

With the buildup of opposition to a higher gasoline tax (to be proposed by the President in January), it looks as if Congress will have to kill the trust fund to keep the road program on schedule. The fund has been going into the hole for the last four months. Senator Gore promised highway executives last week: "There

will be no stretchout" in the program beyond the originally planned 13 years. Money will have to confrom general treasury funds if the trust is killed probably booting the budget for fiscal 1960 anoth \$1 billion. Sen. Francis Case (R., S. Dak.) ranking mority member of the roads subcommittee, also opposing higher gasoline taxes. He is talking up the possibility of a special bond issue to finance the program

Check Defense Budget Carefully

When the new budget for the Defense Department appears in January, don't be misled by some bookkeeping changes. Firms concerned about their defense makets will see research & development accounts junsharply, but there will be no real increase. Defense shifting prototype costs, including fabrication and testing, from production accounts to R&D accounts.

Another point: Add the budget for the Nation Aeronautics & Space Administration to any increase defense spending. Forecasters look for "slight" i crease in fiscal 1960 over fiscal 1959's \$40.8 billion of fense bill, but if you add \$1 billion for NASA, the figures become more realistic.

AEC To Get a Going Over

Next year looks like a natural for politically inspirin investigations of federal agencies by Congress. The Atomic Energy Commission is on the hot seat because of our lagging atomic plane program and bottlenecks the AEC-Budget Bureau relationship. Rep. Mely Price's (D., Ill.) R&D Subcommittee wants several asswers: 1. Why the Budget Bureau holds up AEC funds. 2. Why it takes so long to negotiate a contract between AEC and private firms. 3. What is a "adequacy" of the AEC organization "to get third done."

The Joint Atomic Energy Committee has learned the top level meeting between the White House at Pentagon on the A-plane's future and is determined use the meeting to hang the administration if a cision to advance the program more rapidly is a reached. If another study committee is appointed review the project again, it will charge the administration with deliberately avoiding a decision until forced act by Congress.

Right-To-Work Tactics Get New Slant

Don't look for big campaigns for right-to-work last in industrial states like Wisconsin, Michigan, a Illinois, as some sources have been reporting. Following the November elections, the strategy has shifted less industrialized states like New Mexico, Wyomit Vermont, and Delaware. The effort will probably made through the state legislatures rather than a popular vote route. Right-to-work enthusiasts at talking of wholesale shifts of new plants from "unicotized" states to those with right-to-work laws.

INCINNATI keeps these tough grinding jobs



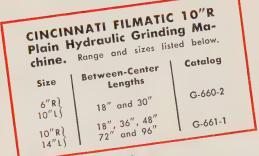
ycle Time Stabilizer automatically compensates for wheel wear

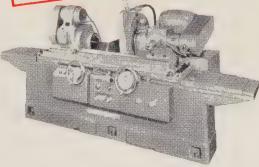
Spline sections and other cutaway diameters are tough on grinding wheels. Ordinarily, frequent adjustments for size and/or length of infeed cycle are required. Cincinnati cures these ills of rapid wheel wear with Automatic Air-Electric Gage Sizing. An exclusive extra advantage of this equipment, Cycle Time Stabilizer, does the trick. It automatically adjusts the length of infeed cycle to compensate for wheel wear and truing. Cycle time cannot increase; rate of production cannot decrease. ¶A horizontally mounted variation of Automatic Air-Electric Gage Sizing is incorporated in the CINCINNATI FILMATIC 10"R Plain Grinder abbreviated in the illustration above. Other automatic features which help to keep the cost of production at a minimum include:

Push-button Automatic Dual Rate Infeed Behind-the-wheel Truing with Cycle Counter Automatic Positioning of Headstock Spindle Gap Eliminator

Flat top table, work cradles, and hydraulic footstock

Write for catalog Nos. G-660-2 and G-661-1. Sweet's Machine Tool File contains brief specs.





GRINDING MACHINE DIVISION
The Cincinnati Milling Machine Co.
Cincinnati 9, Ohio

CINCINNATI

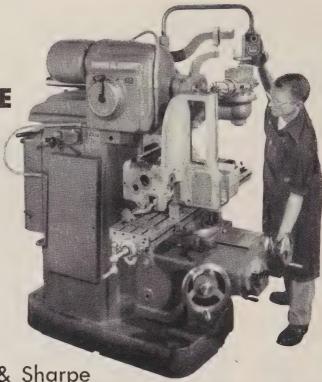
CENTERTYPE GRINDING MACHINES · CENTERLESS GRINDING MACHINES
MICRO-CENTRIC GRINDING MACHINES · CHUCKING GRINDERS
ROLL GRINDING MACHINES · CENTERLESS LAPPING MACHINES

'way out ahead

in WORK RANGE

-in OPERATING ECONOMY

For tools, dies, molds, for prototype work, for maintenance, for any milling job—



COMPARE this capacity!!

28" Table feed
12" Transverse feed
25" Face of column
to center line of
vertical spindle
20 ½" Vertical feed
3½" Hand movemen
quill in universal h

Spindle Speeds

Horizontal Spindles 40 to 1530 Universal Head 80 to 3060

The Brown & Sharpe

ANGENIASTER

®

Universal & Plain Milling Machines — sliding head type

LOWER ORIGINAL INVESTMENT

On the Rangemaster you can take No. 2 size cuts on work pieces whose physical dimensions would normally require the capacity of a more expensive No. 3 or larger size machine.

LOWER SET-UP AND OPERATION COSTS

With the Rangemaster you *clamp the work piece once*, then machine all around it—mill, drill, or bore from any angle. You avoid relocating and re-alignment, with consequent risk of errors. You get more hours of machining time, and minimize set-up time.

LOWER TOOLING COSTS

In the RANGEMASTER, both horizontal and vertical spindles have the same standard No. 40 M.M. taper for interchangeability of tooling. One set of tooling serves for multiple operations. There's no need for costly compounding of tool inventory.

Compare all the features of the Rangemaster, Universal or Plain Type, and you'll agree it's by far your best buy in its class. For details, write: Brown & Sharpe Mfg. Co., Providence 1, R. I.

Brown & Sharpe

MACHINE TOOL DIVISION

MILLING • GRINDING • SCREW
MACHINES
MACHINE TOOL ACCESSORIES



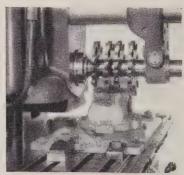
PROGRESS IN PRECISION FOR OVER 125 YEARS

ALL THE ADVANTAGES OF A "RAM-TYPE" MACHINE WITH NO SACRIFICE IN CUTTING ABILITY

In the Rangemaster, all the following features are the same as in a conventional knee-type milling mack of corresponding size:

SAME SPINDLE MOUNTING —
SAME SIZE "BULL" GEAR —
SAME RANGE AND NUMBER
OF SPINDLE SPEEDS —
SAME DIRECT DRIVE

SAME DIRECT DRIVE to both spindles, utilizing full power



Positioning of sliding head adjacent to the wa piece permits mounting of cutters close spindle nose for improved cutting abilit

PRECISION TOOLS . HYDRAULIC PRODUCTS . CUTTERS

Why Does Scrap Need Help?

Guaranteed Annual Wage

O SCRAP WANTS a guaranteed nual wage," observed a steel repentative in Washington. He was cting to the news that a deletion from the Institute of Scrap n & Steel has visited the Office Civil & Defense Mobilization.

Bogeyman?—But reliable sources the scrap folks asked for no cific form of help from governmt; they just laid their problems OCDM's door.

They imply that steelmen have cided to do without a scrap instry, saying: "With consumers essing the utilization of pig iron, me scrap, industrial scrap, and lroad scrap—to the almost total clusion of dealer scrap in some tances—the industry has reluctly concluded that it is connted with a crisis it cannot alone be with."

Four Point Program—To offset e declining use of scrap by steel-ukers, some scrap sellers would er this program: 1. Less reliance foreign ore by the steel industry cause those sources could be shut in an emergency. 2. Outright bsidies to scrap dealers. 3. A scrap

stockpile via the Defense Production Act's authority. 4. Encouragement of exports, particularly to underdeveloped countries.

But insiders admit that such a program would only sustain life, not rebuild a healthy industry.

• Sick, Sick, Sick—Advancing technology has caught up with scrap in more ways than one. Steelmakers are using less of it, and dealers have to have a lot of cash. Twenty years ago, the typical scrap dealer had 35 per cent of his assets in equipment and 65 per cent in cash. Today, the opposite is true.

The industry remembers with irony that two years ago scrap consumers contended exports should be curtailed to protect the domestic supply. It argues now that exports must be boosted to maintain the scrap collecting machinery of the nation.

• Standby—The industry seeks an essentiality rating from the government so it could meet increased demands for scrap which would result, it contends, from an emergency requiring the steel industry to suddenly boost operations.

A minimum living wage, says Myron L. Chase, ISIS president, is \$35 to \$40 a gross ton for No. I heavy melting grade scrap. The industry has operated in that area since October, 1957. Annual contracts are required, he implies, to put scrap back on its feet.

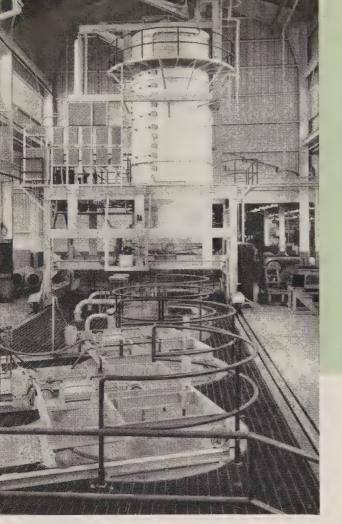
• Help from Steel—The steelmakers have spent millions on ore research; if they would spend 1 per cent as much on analyzing their scrap buying practices, "they would come up with some surprising results," says Mr. Chase.

Instead, he goes on, this trend continues: One mill (within the top dozen steelmakers of the country) has cut its scrap consumption from 40,000 or 50,000 tons a month to 10,000 tons.

The producers of scrap are really the ones to worry, adds ISIS, seeking any sort of outside help for its cause. (Many big automakers and other large scrap generators sell directly to steel mills, a practice which distresses dealers.)

• Crux—"Should a profitable scrap industry exist only when the steel industry is running above 90 per cent of capacity?" ask the dealers.

Whether government can answer them is doubtful. It seems only steel can give that answer, and it may already have by boosting its operations 59 per cent from October, 1957, to April, 1958, while its consumption of scrap increased only about 35 per cent.



Improved Gantry type hardening furnace for missiles. Latest development of standard Gantry type, this huge furnace provides more economical, faster production and improved metallurgical qualities in treating missile parts. The installation consists of the electric, controlled atmosphere, Gantry type furnace and two draw furnaces, a hot water wash tank, a salt bath quench and a nitrogen generator. The Gantry type furnace moves under power over the entire installation to load or unload at any of the pit stations. Both design and installations by Lindberg.

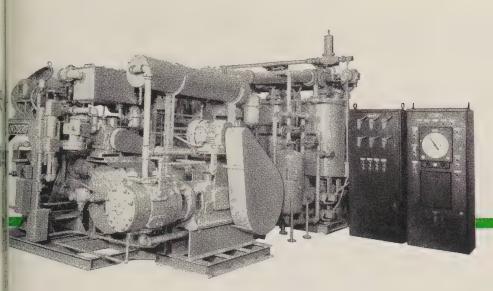
Induction Aluminum Billet Heater. This exclusive new Lindberg induction billet heater provides aluminum extruders with an accurate, efficient solution to a difficult production problem. It features "Metered BTU's", an improved control system for heating aluminum billets. The heating rate of billet is controlled and each billet automatically delivered to the die-casting machine at the exact temperature required for most efficient extrusion.

Full information on any of these new Lindberg developments is available from Lindberg Engineering Company, 2441 W. Hubbard St., Chicago 12, III.

This year alone Lindberg has develope five major improvement in the application of heat to industry

Not so many months back business wasn't booming in the metalworking field. But through this period Lindberg went steadily ahead with its policy of helping make business better by constantly seeking better ways to apply heat to industry. Fortunately, Lindberg has the research experts, the designers the engineers to implement this policy. As evidenced shown on these pages are five major Lindberg developments of the past twelve months. In their respective spheres these offer industry more effective, more productive, more economical industrial heating equipment.





Hyni Nitrogen Generator. This Lindberg Hyni nitrogen atmosphere generator is the latest development in gas processing and assures nitrogen of higher purity than has ever before been achieved by other processes. It is the first unit to provide low cost, high purity nitrogen by a dry, completely automatic process. It is suitable for any application where a high nitrogen, CO₂ free, dry atmosphere is required. The unit functions automatically, and once the generator is started, the entire operation is completely automatic and continuous.

Over the years Lindberg has consistently pioneered phajor advancements in industrial heating equipment. the famous Cyclone furnace, applying the first 00% forced convection heating principle . . . the first igh temperature (2200° F.) endothermic generator . . . ne development of controlled atmosphere generators, ne creation of dew point equilibrium curves to estabsh proper atmosphere values and the exclusive Lindberg arbotrol to maintain these values automatically . . . he "dimple" vertical radiant tube for fuel fired furnaces . . the revolutionary CORRTHERM electrical heating tlement. Lindberg equipment and Lindberg planning

can help you find the most effective answer to any problem of applying heat to industry. We cover the field, heat treating, melting and holding, brazing, enameling furnaces, ceramic kilns, high frequency units, and are in the ideal position to recommend just the type of equipment most suitable for your needs. Consult your local Lindberg Field Representative (see the classified phone book) or get in touch with us direct.

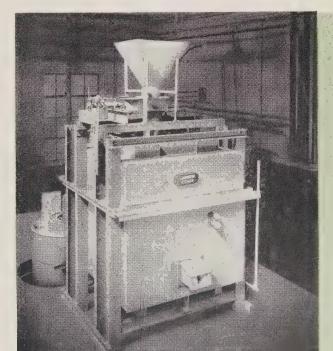
Lindberg Engineering Company

2441 West Hubbard Street, Chicago 12, Illinois Los Angeles Plant: 11937 S. Regentview Avenue at Downey, Calif.

iduct-O-Ring Rotary Salt Bath Furnace. Offering for the first me an electric salt bath furnace that can be shut down over ight or week end and regain efficient operating temperature uickly. Positive quality control is provided by rotary action furnace and variable speed drive which insure exactly same me in bath for all parts. Gives precise temperature uniformity nd control unequalled by any other salt bath furnace design. Iffers greatly lowered operating, maintenance and initial nvestment costs compared with standard externally heated out or electrode types.

Electric Controlled Atmosphere Dry Hearth Melting Furnace. This new Lindberg-Fisher Melting Furnace operates electrically and oxidation of aluminum, or melt loss, is reduced because the entire system can be pressurized with atmosphere. The only oxides incurred are those from the surface of the scrap, as charged. The furnace contains a sloping silicon carbide dry hearth which directs the molten aluminum through a covered trough into the companion holding furnace. Substantial savings in lower melt loss and maintenance is low. Particularly applicable for scrap with steel inserts.





OREIGN OUTLOOK FOR 1959 . . . No. 2



Dual controls operate this equipment for turning sheets in a German barrel works

West Germany Can Rejoice As Free Trade Blossoms

Industry welcomes U. S. investment and knowhow as trend to common market in Europe brings more specialization, higher production volume. Steel capacity increased

TARIFF walls are tumbling in Europe. That's good news for West Germany, now completing a year in which steel production declined 5 to 7 per cent and exports dropped, compared with 1957.

The European Coal & Steel Community has abolished trade barriers in steel. The six-nation European common market (it includes West Germany, the Netherlands, Belgium, Luxembourg, France, and Italy) will initiate a 10 per cent reduction in customs rates on Jan. 1, 1959.

West Germany and France are the strongest nations in the common market. Members cut tariffs and raise import quotas to stimulate trade with each other. They maintain a common tariff on imports from other nations. By 1970, all tariffs and import quotas tween common market nations be eliminated.

• More Specialization—The comon market will bring a thoroworkaul of industry within Eurowerkaul of industry with Italians, Fremand others. Manufacturers in others will reciprocate.

Benefits will include larger vume production and a greater m ket for a smaller product line. So German small businesses hope grow out of marginal size. Desithe trend to a common mark German industry continues to f a strong competitor in Great Beain

England opposes the comm market. That nation suggests a I trade area to include 12 Europo nations, each of which could tablish individual tariff police Germany and France have agree to reject this proposal, althouthey will extend the January, 19 tariff reductions to include Engligoods. The two nations also very promote multilateral associations common market nations with of siders.

 American Interests—Growth the common market is attract U. S. investors. The number of censing agreements is increase rapidly. Special alloy steel proucts developed in the U.S. are ing produced at a plant in Dil laken, jointly owned by Arm Steel Corp. and August Thysse Huette A.G. About 30 large el tronic computers, mainly of U. design, have been installed in W Germany. Americans are investigation knowledge in addition to capil Several management consult firms in the U.S. have large fices in Germany. American pul relations firms have set up shop such German cities as Dusseldel

German steelmakers are increasing shipments to this country, U. S. wire mills can attest. Barkwire, nails, wire rods, structure plates, and tubes are flowing it coastal areas and the Great Labregion. With completion of the Lawrence Seaway, shipments sheets to Detroit may be interfied, but no large-scale increase exports to this country is predictin 1959.

Germany is shipping a bout 1,000 cars and trucks to the S. this year. Shipments may inase in 1959 if Volkswagen can n its six-month order backlogout 90 per cent of West German s shipped to the U. S. are Volkszens.

With sales to some western couns slackening, Germans may st their exports to the Comnist bloc, including China. Exts to eastern nations have been gligible, except for a 400,000-ton pment of shapes and tubes to fina last summer.

Despite a drop in steel producfrom 27 million net tons in 7 to an estimated 25.4 million s in 1958, optimism remains h in this West German indus-

Actual consumption of the metal reportedly 1 to 2 per cent higher in 1957, but an inventory cutak among steel buyers keeps protetion lower.

Anticipating the end of inveny reductions, steelmakers will ild their capacity to 32.3 million is by the end of 1959 and to 4 million tons by 1960. Steelikers expect an annual increase capacity of 2.5 to 3 per cent durthe next decade.

France Flexes Muscles

FRANCE, which shares with West Germany leadership of the six-nation European common market, also shares the long range optimism of other member nations.

France's industrial production is double the prewar level and is expanding by about 10 per cent per year. Frenchmen claim they enjoy the fastest growth rate in the west-tern world. Employment is high and productivity has increased by 31 per cent in the last five years.

• Foreign Markets Grow—Exports are being promoted. Among leading products are the Renaults shown on this page. Steel exports are on the rise, too. In nine months of 1958, they totaled almost 3 million tons.

The auto industry, fourth largest in the world, is one of the brightest aspects of industry in France. Automakers in 1957 produced 724,000 passenger cars and 204,000 trucks, a 12 per cent gain over the previous year.

Car and truck registrations have increased almost 20 per cent in two years.

In the first ten months of this year, auto plants produced 929,481 vehicles. Estimated November and December production: 180,000 vehicles. Total output for the year will approximate 1.1 million units.

• Auto Exports Rise—Passenger car exports increased from 150,000 in 1957 to an estimated 240,000 vehicles in 1958. Most spectacular customer is the U. S. Some 45,100 French cars were sold in the U. S. in 1957, but this total was reached in seven months of 1958. Probable total shipments to the U. S. in 1958: 75,000 to 80,000 units.

Renault built its exports to the U. S. from 35,000 cars in 1957 to an estimated 60,000 in 1958. That firm produced 336,000 passenger cars last year and exported 35 per cent of them.

Simca shipped 12,031 cars to the U. S. in the first nine months of 1958, compared with only 3374 in 1957. Having completed a sales agreement with Chrysler Corp., Simca expects to send 60,000 cars to the U. S. in 1959.

• Tough Selling in Europe—Despite formation of a common market, France faces problems similar to those of the U. S. when it competes in Europe. France has comparatively high labor costs and comprehensive social security systems. To compete successfully, France faces the choice of cutting its labor costs or raising the economic levels of its neighbors.

Frenchmen believe success of ECSC proves the workability of the common market. Steel and pig iron output in 1958 furnishes proof of the strength of the nation's industry. While over-all ECSC steel production in the first nine months of 1958 dipped 1 per cent from the corresponding period of 1957, French steel output advanced 6 per cent and pig iron output grew by 1.5 per cent. Steel output was 12 million tons in the first nine months of this year.

• Steel Keeps Growing—Steelmakers anticipate an expansion of 8 per cent each year for the next three years. This will raise the country's steel capacity to 18.5 million tons by 1961.



ew Renaults being swung aboard ship for export to U. S.

How COMPLETE Caw You Get? Company, Company,



Large Warehouse Stocks at THE HOUSE OF **STAINLESS Unlimited Mill Sources** Can Give YOU the Stainles **Tubular Products You New**

For Any Application

Supplying special 2" x 4" stainless tubing for these unique architectural guard rails is typical of the lengths to which CSS goes in meeting customers' varying needs.

Whether your requirements call for welded, seamless, centrifugally-cast, or fabricated stainless tubular products, The House of Stainless is your most complete and dependable source of supply. But this service goes beyond just filling orders. Here, you can expect and get every possible technical assistance. In selecting the type of tubing that will do the best job for you at the lowest possible cost. In adapting present facilities to obtain all the advantages inherent in stainless. In counseling with you to give you the benefit of our experience with related applications.

Regardless of what you may need in stainless steel—tubular products, sheet, strip, plate, bars, fastenings—you can count on prompt deliveries from our ever-expanding warehouse stocks or through direct mill shipments through our mill placement department.

CHICAGO STEEL SERVICE COMPANY



Please phone LA ayette 3-7210

Kildare Avenue at 45th Street, Chicago 32, Illinois • Mailing Address: P.O. Box 6308, Chicago 80, Illinois

Milwaukee District Office: 757 N. Broadway, Milwaukee 2, Wisc. Telephone: BRoadway 3-7874 Sales Representatives at Bloomington and Rockford, Illinois

Indianapolis and South Bend, Indiana Davenport, Iowa • Grand Rapids, Michigan • Minneapolis, Minnesota • Appleton, Wisconsin

YOUR DEPENDABLE SOURCE FOR BOTH CARBON AND STAINLESS STEEL



Anglia de Luxe

Midwest price:	\$1,601	Engine: 4 cyl.,	side valve
Wheelbase:	87 in.	Displacement:	71.5 cu in.
Length:	149.7 in.	Horsepower: 36/	4,500 rpm
Height:	58.7 in.	Comp. Ratio:	7.0:1
Curb weight:	1,716 lb	Torque:	53/2,500
Cap.:	4 pass.	Axle Ratio:	4.4:1



Squire Station Wagon

Midwest price:	\$1,801	Engine: 4 cyl., side valve
Wheelbase:	87 in.	Displacement: 71.5 cu in.
ength:	141.5 in.	Horsepower: 36/4,500 rpm
Height:	62.2 in.	Comp. Ratio: 7.0:1
Curb weight:	1,870 lb	Torque: 53/2,500
Cap.:	6 pass.	Axle Ratio: 4.4:1



Consul Mark II

Midwest price:	\$2,084	Engine:	4 cyl., OHV
Wheelbase:	104.5 in.	Displacement:	103.9 cu in.
Length:	172.0 in.	Horsepower: 59	9/4,200 rpm
Height:	61.5 in.	Comp. Ratio:	7.8:1
Curb weight:	2,504 lb	Torque:	92/2,300
Cap.:	6 pass.	Axle Ratio:	4.1:1

Ford, GM Imports Push Volkswagen

MPORTED CAR BUFFS are well ware of names like Volkswagen and Renault, but until this year ney've paid less attention to cars roduced overseas by Ford Motor o, and General Motors Corp. Their sales are beginning to make dent in the import field.

Of the two firms, Ford has made ne biggest splash with its English ords and German Taunus. It ofers four wheelbases, eight basic nodels, and more than 20 body tyles, including four English van nd bus models. All the cars are tyled along American lines and uilt with unitized bodies. Manual cansmissions are standard, but most models offer optional semiautomatic shifts. Gasoline consumption is 25 to 35 mpg. Suggested import prices (above and Page 100) include federal excise tax, ocean freight, handling, and import duty. They exclude license fees, state and local taxes, and dealer installed accessories.

• So Many Sales—In 1950, two years after it started importing, Ford sold 1,869 English Fords. Last year's import sales were 17,062. Ford says sales will be about 36,000 this year; it's looking for 40,000 in 1959. There are 600 English Ford dealers in this country.

Early this spring, the company started importing its German built Taunus, and company estimates call for 2000 deliveries this year. There are 120 Taunus dealers in the country, and Ford doesn't deny reports it wants to double that number. The Taunus plant at Cologne, Germany, is being enlarged, and Ford predicts it will sell 10,000 Taunuses in the U. S. next year—giving the company total import sales of 46,000 or 9 per cent of the anticipated 1959 import market (400,000 units).

• GM Uses Soft Sell — Ford has been pushing imports aggressively,





Zephyr Convertible

Midwest price:	\$2,624	Engine: 6	cyl., OHW
Wheelbase:	107 in.	Displacement: 1	55.8 cu im
Length:	178.5 in.	Horsepower: 86/	4,200 rpm
Height:	61.9 in.	Comp. Ratio:	7.8:T
Curb weight:	2,691 lb	Torque:	136/2,000
Cap.:	3 pass.	Axle Ratio:	3.9:1

Taunus de Luxe

Midwest price:	\$2,224.50	Engine: 4 cyl., OHW
Wheelbase:	102.5 in.	Displacement: 103.62 cu inn
Length:	172.2 in.	Horsepower: 67/4,400 rpm
Height:	57.7 in.	Comp. Ratio: 7.1:1
Curb weight:	2,260 lb	Torque: 98/2,200
Cap.:	6 pass.	Axle Ratio: 3.9:T

but GM seems to be offering its German Opel and English Vauxhall mainly to appease Buick and Pontiac dealers who sell the cars. Monthly import quotas were set at 1500 units for each make this year, but Pontiac reports 16,371 Vauxhalls have been imported through November. Sales have bettered 2000 a month since June. September registrations show the British job is

in fourth place among imports, directly behind the English Fords (Volkswagen and Renault are first and second).

Buick reports about 17,000 Opels have been imported during the same period. That's quite a change from two years ago when the only Opels seen in this country were those brought back by servicemen (See Steel, Dec. 10, 1956, p. 111).

• Chrysler's Starting — The other member of the Big Three is just getting into the import game. Chrysler Corp. officially took over marketing of the French built Simca in September. The company admits its prime reason for acquiring Simca stock and distribution rights is to make it competitive in the European market place.

Nonetheless, Chrysler wants 700 of its dealers to handle the Simca in this country. The French automaker has registered 13,031 cars in the U. S. through September. Almost all were sold through non-Chrysler dealers. Chrysler says it's shooting for 15 per cent of the 1959 import market (60,000 units). There are nine Simca models available now; two more will be introduced next May.

 Why Build Here?—Such growth makes one wonder why Ford wants to build a smaller car in this contry. There seem to be three be reasons: 1. Ford's (and GMU. S. built car will be slightly later than its similarly priced important marketeers are convinced than slightly larger car is what Arm can economy car buyers reawant. 2. Import duties and sliping costs reduce the profits on eign built cars. 3. The expanded European car market is likely consume most of the future of seas production of these compares

Exhaust Notes

• Ford Div. started building luxury Galaxie series last week features six body styles, including retractable hardtop. The Galawill go to dealers next month. lists \$48 higher than Ford's Foliane 500 series.

Beat Experts Contest

Have you entered Steel's Beat the-Experts contest? You can wire a scale model of General Motors Firebird III if you make the best guesstimate of how many automobiles will be produced in the U.S. during the first six months of 1959. Ten runners-up will receive color prints of a dream car. Entry blanks can be found in previous issues of Steel.

U. S. Auto Output

Passenger Only	
1958	1957
January 489,357	641,591
February 392,112	570,650
March 357,049	578,356
April 316,503	548,656
May 349,474	531,413
June 337,355	500,266
July 321,053	495,625
August 180,324	525,363
September 130,426	283,862
October 261,696	327,362
November 514,099	578,600
11 Mo. Total 3,649,448	5,581,744
December	534,714
Total	6,115,458
	-,,
Week Ended 1958	1957
Nov. 8 125,279	136,742
Nov. 15 117,688	141,904
Nov. 22 138,727	151,846
Nov. 29 123,088	114,795
Dec. 6 146,045†	139,506
Dec. 13 150,000*	145,503
Source: Ward's Automotive Preliminary. *Estimated	Reports. OY STEEL.



uniform in tensile strength and resistant to deflection under load, and J&L's spring wire has consistently been of this quality," reports a Universal purchasing executive.

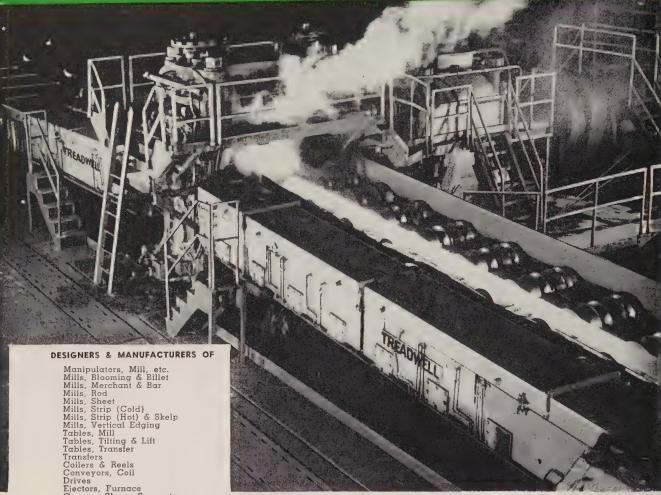
J&L achieves this uniformity in spring wire through rigid quality controls in every phase of production from ore mine through finished product. Only first-class uniformity of physical and dimensional characteristics. The resulting high quality speeds production and reduces rejects in automatic operations such as those of Universal.

Call your J&L representative for your next order of spring wire. Or write to Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pa.

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

readwel



Photograph Courtesy Jones & Laughlin Steel Corp

Drives
Ejectors, Furnace
Ejectors, Furnace
Gauges, Shear, Saw, etc.
Beds, Cooling
Beds, Inspection
Bumpers, Furnace
Pushers, Furnace
Pushers, Furnace
Repeaters
Handling Equipment (Kickoffs, Pilers, Cradles, etc.)
Steel and Iron Castings
Ni-Hard and Ductile Iron
Castings Castings

40' long 28" three-hi mill tilting tables for diamond and square pass rolling of bars, billets and blooms. Materials automatically manipulated from pass to pass with manipulators. Our Engineers will be glad to discuss your mill problems with you.



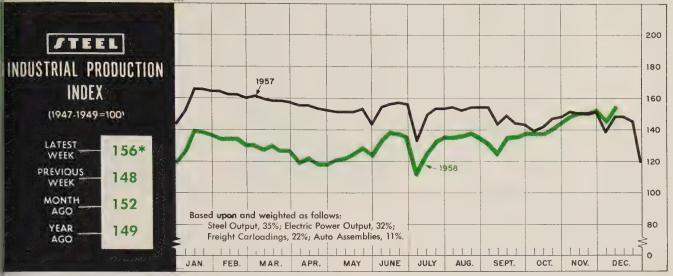
208 S. LA SALLE STREET

CHICAGO 4. ILL. CEntral 6-9784

SALES AND ENGINEERING OFFICES:

140 CEDAR STREET NEW YORK 6, N. Y. WOrth 4-3344

1015 FARMERS BANK BLDG. PITTSBURGH 22, PA. ATlantic 1-2883



Week ended Dec. 6.

Autos, Electricity Push Index Up

NEW 1958 HIGHS in two of the four elements making up Steel's industrial production index (above) have pushed it to its highest point in nearly a year and a half. The preliminary reading for the week ended Dec. 6 is 156 (1947-49 = 100), a recovery of 8 points from the revised Thanksgiving week mark of 148.

The most encouraging sign on the metalworking front is the rate at which new cars are being built. Production of autos and trucks during the week ended Dec. 6 totaled 169,420 units, says Ward's Automotive Reports, the highest mark since mid-November, 1957, and it will go even higher before the month is over, unless labor troubles continue to take their toll. Schedules call for output of about 600,000 autos, compared with November's 514,099 units.

• Catching On—Retail sales are finally coming up to expectations. During the last ten selling days in November, dealers sold new cars at a rate of 18,500 a day. The month started out at an 11,740 per day rate. Even if sales were slower, production schedules would remain strong because dealers' stocks—at 500,000 units—are still well below year-ago levels.

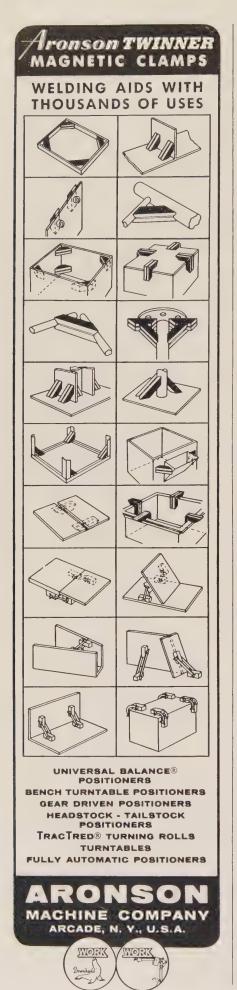
Heavier auto production schedules are being felt in supplier industries, especially steel. After slumping to a seven week low of 1,985,000 net tons, the industry was expected to jump back close to the year's best levels last week. Aside from renewed automotive buying, continuing strength is being shown in other important markets, such as appliances and construction. But

steel production has had little influence on the movement of production indexes for the last two months. It has fluctuated within a relatively narrow range of 40,000 tons a week.

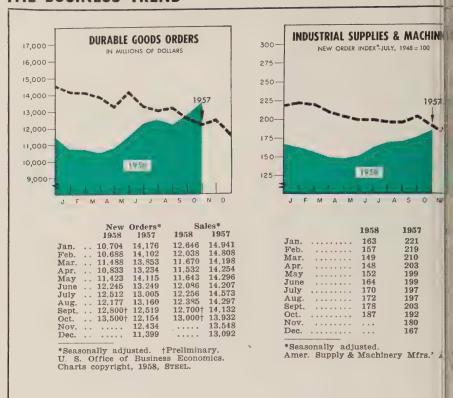
• Charging Up—If preliminary estimates hold up, the electric utility

BAROMETERS OF BUSINESS	LATEST	PRIOR	YEAR
	PERIOD*	WEEK	AGO
Steel Ingot Production (1000 net tons) ²	2,015 ¹	1,985	1,770
	12,900 ¹	12,274	12,315
	7,545 ¹	8,745	8,184
	6,975 ¹	6,983	6,850
	\$399.1	\$273.0	\$201.0
	177,893 ¹	153,187	167,760
TRADE Freight Carloadings (1000 cars) Business Failures (Dun & Bradstreet) Currency in Circulation (millions) ³ Dept. Store Sales (changes from year ago) ³	600 ¹	539	618
	244	260	235
	\$32,057	\$31,825	\$31,666
	+1%	+2%	-20%
FINANCE Bank Clearings (Dun & Bradstreet, millions) Federal Gross Debt (billions) Bond Volume, NYSE (millions) Stocks Sales, NYSE (thousands of shares) Loans and Investments (billions) 4 U. S. Govt. Obligations Held (billions) 4	\$282.8 \$31.9 17,565	\$23,231 \$283.5 \$27.7 16,941 \$93.8 \$31.3	\$22,099 \$274.8 \$28.5 11,077 \$86.1 \$25.0
PRICES STEEL'S Finished Steel Price Index ⁵ STEEL'S Nonferrous Metal Price Index ⁶ All Commodities ⁷ Commodities Other than Farm & Foods ⁷	217.5 119.0	247.82 217.5 119.1 126.9	239.15 206.5 117.9 125.7

*Dates on request. ¹Preliminary. ²Weekly capacities, net tons: 1958, 2.699,173; 1957, 2.559,490. ³Federal Reserve Board. ⁴Member banks, Federal Reserve System. ⁵1935-39 \pm 100. ⁶1936-39 \pm 100. ⁷Bureau of Labor Statistics Index, 1947-49 \pm 100.



THE BUSINESS TREND



industry will post an all-time high for the week ended Dec. 6. Figures compiled by Edison Electric Institute show that recent weeks have been running 5 per cent or more ahead of their 1957 counterparts. The seasonal bulge following the Thanksgiving holiday should boost output to 12.9 billion kw-hr of electricity, compared with the previous high of 12.851 billion recorded during the second week in July.

Unfortunately, only a small part of the increase can be traced to greater industrial production. It stems mostly from the lighting of Christmas decorations in the nation's shopping centers.

Freight carloadings remain about 2 per cent below their corresponding 1957 levels. There are indications that business is stronger than anticipated, partially offsetting the effects of a seasonal downtrend.

Slowdown Is Healthy Sign

Many economists view the slowdown in production during November as a normal reaction in an otherwise fairly fast recovery, but "few find in it any evidence that the rise is ending or the trend reversing," claims the First National City Bank of New York. To the contrary, the bank's economists feel the "recovery will be more sound!" based, less vulnerable, and likely the go farther in the long run if restraint is shown now."

Economists at New York's Guaranty Trust Co. tend to view November as a strike-interrupted period in the uptrend rather than natural slowdown. "In terms of the number of workers involved and manhours lost, the work stoppages have been worse than any thing since the middle of 1956. It addition to disrupting automobil assemblies, labor disputes have curtailed production and depressed in come in the machinery, electrical machinery, glass, and fabricate metal industries."

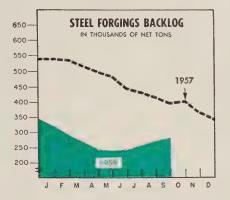
The inference is that withous strikes, the Federal Reserve Board industrial production index would not have been held to I point gain during September and October Now that most of the labor troubles are over, the FRB index should continue its 2 and 3 point gain during November and December.

A poll of 140 financial leaders as a meeting of the National Association of Credit Management indicates that business can expect stability in the coming months, part



	1958	1957	1956	1955
Jan.	 174.5	259.3	245.5	140.9
Feb.	 179.1	239.5	256.2	148.5
Mar.	 173.7	262.4	276.5	172.8
Apr.	 153 2	221.7	264.7	179.8
May	 142.2	263.2	275.6	205.2
June	 173 8	215.9	245.4	193.5
July	 133.3	211.4	286.7	201.7
Aug.	 162.1	225.8	219.5	217.6
Sept.	 170.7	174.9	230.5	246.5
Oct.	 175.9	207.0	299.8	227.6
Nev.	 	165 3	216.2	210.4
Dec.	 	150.8	235.7	245.5
Avg	 	216.4	254.4	198.3

American Gear Mfrs. Assn.



	Shipr	nents	Unfilled	Orders	
	1938	1957	1958	1957	
Jan.	 108	148	318	537	
Feb.	 93	135	288	533	
Mar.	 92	146	266	517	
Apr.	 83	139	242	497	
May	 78	135	240	479	
June	 87	128	242	445	
July	 67	104	257	431	
Aug.	 80	115	270	417	
Sept.	 89	117	280	397	
Oct.	 	126		401	
Nov.	 	105		365	
Dec.	 	99		343	

U. S. Bureau of the Census. Data based on reports from commercial and captive forge shops with monthly shipments of 50 tons or more.

ly because production is fairly well in line with consumption. Dr. John W. Harriman, economist for the Tri-Continental Corp., New York, says: "The next major development should be a substantial increase in consumer purchases of durable goods." This places great importance on the automotive industry.

Orders Presage Upturn

That the trend is securely pointed upward is obvious in the light of recent reports on new orders and shipments, especially in the durable goods sector. (See graph and table, Page 104.) Orders for all manufacturing industries topped the \$27 billion mark for the first time since the recession started. For durables, the gain was one of the biggest since the upturn started in May.

Even though incoming business exceeded shipments on a seasonally adjusted basis, manufacturers' backlogs continued to decline. The raw figures still showed that shipments were ahead, but that situation could be reversed within a month

Seasonally adjusted inventories stood still in October, perhaps marking the end of inventory liquidation and the beginning of stock buildup in November.

Building Contracts Slip

Something is amiss in the construction industry. Awards of new contracts for heavy construction projects, as measured by Engineering News-Record, dipped 10 per cent below the corresponding 1957 total at a time when most observers were predicting record levels next year for work put in place. (This year's contracts will be next year's work.)

A dip at this time of year is not particularly surprising—it's seasonal. But to fall beneath 1957's mediocre level is to invite some doubt about the glowing forecasts.

But there are reports which tend to uphold the predictions. Dun & Bradstreet Inc. says that building permits in 217 cities in October topped the previous high for the month by 26.2 per cent.

For the short term, things are still booming, with work put in place last month topping the yearago figure by \$200 million. \$4.4 billion, compared with September's \$4.7 billion, the decline was less than seasonal.





The Temperature Control Designed for Fast

"DO IT YOURSELF" MAINTENANCE

Right on the Job!

Rugged simplicity of design—along with the direct, positive power of mercury-actuation—combine to give Partlow maintenance and performance advantages no other type of temperature control can hope to equal.

Simplicity in the Partlow, for one thing, means that the control element can be changed at the job site in a matter of minutes with no other tool than a screwdriver . . . ''Down time'' is cut to an absolute minimum!

And simplicity in the Partlow also means the complete elimination of fussy electronic gadgets, del-

icate levers, hairsprings and other accessories that have a tendency to break down at the first trace of jar or jostle. Partlow controls are famous for their unfailingly accurate performance even under the most adverse operating conditions.

If you use or manufacture process equipment within the -30° to 1100° F. range, there's a Partlow pneumatic, electric or self-contained gas control (recording, indicating or non-indicating), to fit your application *precisely*. For details, write The Partlow Corp., New Hartford, New York. Dept. S-1258.

Diagrammatic view of the new MFS reveals "quick-change" feature common to all Partlow controls. In case of damage, merely unscrew at points (A) and (B), and remove element (C) from case. Reverse this process, and your Partlow is ready to resume operation.

You can pay more but you can't buy better than

PARTLOW

TEMPERATURE CONTROLS



HANS H. SONDEREGGER Gifford-Wood appointment



ROBERT C. TROW King-Seeley v. p.



JAMES B. PASCHAL Alemite & Instrument post



PETER B. McSHERRY JR. Parker-Kalon sales v. p.

Hans H. Sonderegger was appointed director of engineering and research for Gifford-Wood Co., Hudson, N. Y. For the last 30 years he has been with Sauerman Bros. Inc., Bellwood, Ill., and Link-Belt Co., Chicago.

Wayne Miller was named chief metallurgist of the Cleveland Rock Drill plant, Le Roi Div., Westinghouse Air Brake Co. He held a similar position with Tinnerman Products Inc., Cleveland.

Pittsburgh Bridge & Iron Works, Pittsburgh, appointed David B. Hughes sales manager; Edward T. Baughman, assistant to vice president; Robert L. Haenel, chief engineer.

Donald C. Kane was named sales manager for the western division plant of Industrial Tectonics Inc., Compton, Calif.

L. E. Hart was made director of manufacturing engineering, Hussmann Refrigerator Co., St. Louis. He was manager of manufacturing engineering at the Nashville, Tenn., plant of Avco Mfg. Co.

Jack D. Edwards was named manager, central production planning department, Republic Rubber Div., Youngstown, Lee Rubber & Tire Corp.

Philip M. Dinkins was elected president, General Aniline & Film Corp., New York, to succeed John Hilldring, now chairman. Mr. Dinkins was vice president-general manager, Dyestuff & Chemical Div.

Robert C. Trow was elected vice president, King-Seeley Corp., Ann Arbor, Mich. He also was made general manager, Queen Products Div., formerly a subsidiary company. Rayville A. Trow, founder and former president of Queen, continues with the division as a consultant. Robert J. Lickteig, sales manager for the Scotsman Ice Machine line, was also named vice president of the parent corporation.

James B. Paschal was appointed manager of quality control, Alemite & Instrument Div., Stewart-Warner Corp., Chicago. He succeeds O. R. Swanson, recently appointed assistant to the manager of manufacturing.

Norman E. Bateson was made director of research and development for Pullman-Standard Car Mfg. Co., Chicago. He succeeds O. C. Maier, resigned as of Dec. 1 to accept a position as associate dean of engineering at the University of Massachusetts.

William C. Hanna was made field sales manager for Superior Tube Co., Norristown, Pa. Lloyd M. Huston was made sales-service manager.

Leland A. Doan replaces R. L. Curtis at San Francisco as western division general manager of Dow Chemical Co., Midland, Mich. Mr. Curtis continues as a vice president and will remain as senior officer on the West Coast. Dr. E. O. Barstow, of Midland, retired as vice president, but was named to the new post of honorary chairman.

Peter B. McSherry Jr. was elected vice president-sales, Parker-Kalon Div., General American Transportation Corp., Clifton, N. J. He was sales manager, Socket Screw Products Div., Bristol Co.

John L. Taggart joined American Bosch Arma Corp., Hempstead, N. Y., as director of marketing, with primary responsibilities in defense programs. He was executive vice president and general manager, Liberty Aircraft Co.

Alvin T. Hanson Jr. was named manager of Chrysler Corp.'s New Process Gear Div., Syracuse, N. Y. He was manufacturing manager of the company's plant at Indianapolis. James W. Craft was named director of organization for Chrysler

Ray W. Fanning, plant manager from 1949 to 1957 of Morrison Steel Products Inc., Buffalo, returned to the company as works manager, with enlarged responsibility. He recently served as plant manager for Industrial Metal Works Corp.

Edwin S. Elliott was named executive vice president, Hill Mfg. Co., Wauseon, Ohio.

William J. Patterson was appointed comptroller, Ford Instrument Co., division of Sperry Rand Corp., Long Island City, N. Y.

Gerard W. Metz was named manager of construction for Lehigh Construction Co., subsidiary of Lehigh Structural Steel Co., Allentown, Pa. Donal J. Lonergan was







R. S. STRICKLAND

R. E. KLARE

R. W. MUZZY

Federal-Mogul-Bower Bearings management posts

named assistant manager-construction.

R. S. Strickland, former vice president-sales and marketing, Federal-Mogul-Bower Bearings Inc., Detroit, was elected vice president-general manager, bearing divisions. He heads a new grouping of the bearing divisions (Bower, Federal-Mogul, and Bearings Co. of America). R. E. Klare, former general manager, Federal-Mogul Div., was promoted to a new post of vice president-operations, bearing divisions. He is succeeded by R. W. Muzzy as general manager, Federal-Mogul Div.

Rudolph B. Flershem retires as chairman and chief executive officer of Buffalo-Eclipse Corp., North Tonawanda, N. Y. He is succeeded by Ralph F. Peo, president of Houdaille Industries Inc., which acquired control of Buffalo-Eclipse. Mr. Flershem continues with the company as vice chairman, a new post.

L. duPont Yager, vice president of Reynolds Aluminum Sales Co., was appointed to direct Reynolds Metals Co.'s distributor sales operations, Detroit. He was general manager, Great Lakes sales region, and most recently served in Reynolds' automotive sales at Detroit. Mr. Yager succeeds William F. Morrow, who joined Pioneer Aluminum Co. in Los Angeles.

L. Gardner Kreiser was made assistant production control manager, Milwaukee operations, AC Spark Plug Div., General Motors Corp. He was superintendent of gyro manufacturing. Meril E. Johnson

was made manager of the Washington office of AC Spark Plug's electronics division.

Hugh V. McGuire was made assistant to the sales manager of Enthone Inc., New Haven, Conn. He will specialize in marketing metal finishing equipment and accessories.

Vernon H. Patterson was appointed metallurgical engineer by Vanadium Corp. of America, New York. Affiliated with the engineering sales division, he is in Chicago. Mr. Patterson was with Texas Foundries Inc.

Radio Corp. of America appointed Ralph S. La Montagne manager of marketing, missile electronics and controls department, RCA Defense Electronic Products, Burlington, Mass.

Robert E. Sperber was appointed assistant to the president, O. Hommel Co., Pittsburgh. He was sales promotion manager, Geometric Stamping Co.

B. D. Claffey was elected a vice president, Dayton Malleable Iron Co., Dayton, Ohio. He is general manager, GHR Div.

John W. Allister joined Ajax Sheet Metal & Iron Works, Milwaukee, to head estimating and production planning. He was with Fabricated Metal Products Co.

E. L. Mills was made district manager at Duluth for Link-Belt Co. He replaces R. P. Sayers, advanced to the Chicago district sales office.

R. O. Wolcott was appointed director of administration, aeronautical

division, Minneapolis - Honeywe Regulator Co., Minneapolis.

George J. Papas was appointed vii president-purchasing, Rheem Mfl M. Co., Chicago. Robert G. Belonder was made vice president-industrible relations. Mr. Papas was directed of purchasing. They are in New York.

William E. Kennedy was appointed as ales manager at the Kenilworth of N. J., plant of Jones & Laughli of Steel Corp.'s stainless and strip do vision. He was general sales manager, Canfield Steel Co., division of Lifetime Products Corp.

Russel H. Meyer was appointed marketing assistant of Hancock Industries Inc., Jackson, Mich. In addition, he will assist in sales of two Michigan manufacturing divisions, Telecontrol and Hancock Mfg.

Albert E. Kornhauser was elected treasurer, Controls Co. of America Schiller Park, Ill. He succeed John Ruane, resigned.

Robert M. Kilgore succeeds the late Robert B. Sanders as New York district sales manager of National Steel Corp.

William H. White was made Bulfalo district sales manager, Fulton Sylphon Div., Robertshaw-Fulton Controls Co.

Frank B. Murray fills the new pose of western regional manager for Murray Mfg. Corp. at Los Angeles He was formerly sales engineer for Hoffman Electronics.

Homer D. Sullivan was named Chii cago district sales manager for Plasteel Products Corp.

J. R. Cornell was appointed acting purchasing agent, boiler division. Babcock & Wilcox Co., at Barberton, Ohio. Former assistant general purchasing agent, he succeeds W. C. Moulder, who was named to the staff of P. H. Setzler, vice president of the division's manufacturing department.

John M. Walker was elected controller of Metals & Controls Corp., Attleboro, Mass.

D. Gray Slawson was named sales manager of the new industrial di-

STANDARDIZE WITH VERSATILE AMBALLOY STEELS

There are a lot of reasons for standardizing with Amballoy—personalized steels from Byers. The most important

is that you save money.

Here's how. First: the very versatility of Amballoy enables you to reduce vour necessary chemistries to one or two. Second: through heat treating, you can match this metal to your most exacting physical characteristics.

It's an ideal way to increase your "internal revenue." Metal-users who standardize on Amballoy shrink unproductive capital. Their inventories and special handling and processing costs are drastically reduced. There's more to the story. And the Byers metallurgist has it. Let him show you how Amballoy steels can qualify as the workhorse material for your critical applications.

For further information and the name of your Steel Service Center stocking Amballoy, write or call: Manager of Steel Sales, ATlantic 1-8110, A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

SAVE THROUGH YOUR STEEL SERVICE CENTER

The savings are very real.

Your Steel Service Center is manned, equipped, stocked and located to serve you metal-users at a fraction of what it would cost you to serve yourselves. Consider the advantages, the savings in letting your Steel Service Center distributor carry the vast inventory. Let him meet those 24-hour commitments. Let him do the slitting, flame-cutting, sawing, shearing. Let him pay for the space and manpower to do it.

That's his business. He's an old pro at it. So let him roll with the market's uncertainty. Let his capital, his equipment, his record-keeping assume the brunt of today's high operating costs. Let him process your order for

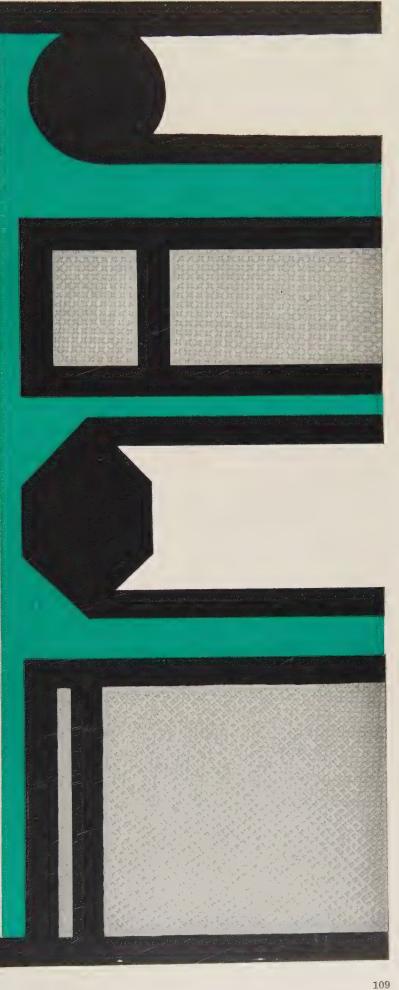
Amballoy steels.

And when you need help in standardizing on the right alloys for your requirements, write or call us: ATlantic 1-8110, A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

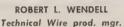


A. M. BYERS COMPANY

AMBALLOY ELECTRIC FURNACE QUALITY STEELS









N. T. WONSETLER
Truscon production mgr.



MRS. LAURENCE PELLIER joins Inco research lab

vision of Haskelite Mfg. Corp., Grand Rapids, Mich.

Robert L. Wendell was named production manager of Technical Wire Products, Springfield, N. J. Malcolm S. Pringle was named treasurer.

Republic Steel Corp.'s Truscon Div., Youngstown, named N. T. Wonsetler production manager, and H. P. Crowley, superintendent of Departments E and S, where special and standard type windows are produced. For the last five years, Mr. Wonsetler has been assigned to Republic's headquarters in Cleveland to assist in production planning at various company steel plants and manufacturing divisions.

Fred A. Martin was made general sales manager, parts division, Warren, Pa., Sylvania Electric Products Inc.

Clarence E. Griese was appointed general sales manager, Ohio Hoist Mfg. Co., Lisbon, Ohio.

Harry F. Isaman was appointed western field engineering representative, Bendix Industrial Controls Section, Bendix Aviation Corp., Detroit. He is in Los Angeles.

Eugene H. Nelson was made a district representative, Koehring Div., Koehring Co. His office is in Dallas. Mr. Nelson was a district representative for Parsons Div. at Newton, Iowa.

L. F. Harding, formerly with the Detroit office of C. O. Bartlett & Snow Co., transferred to the Chicago district in charge of sales. He has offices at Oak Park, Ill.

Mrs. Laurence Pellier joins the staff of the research laboratory of International Nickel Co. Inc. at Bayonne, N. J. A specialist in the application of electron microscopy to problems of physical metallurgy, Mrs. Pellier becomes a member of the laboratory's physics section. She will study microstructural changes which occur in jet engine and other high temperature alloys subjected to high stresses at high temperatures.

Benny Silvestain was elected treasurer of Empire Steel Corp., Mansfield, Ohio.

James H. Felt was elected secretary of Acme Steel Co., Chicago.

Walter W. Hutchinson was named sales manager, Cullman Wheel Co., Chicago.

Norman J. Kirk was elected president and general manager, Toledo P:pe Threading Machine Co., Toledo, Ohio. For the last ten years, he has been with E. W. Bliss Co., serving as vice president and general manager of its Toledo operations.

Edward J. Martin was made director of purchasing for Mele Mfg. Co. Inc., Utica, N. Y.

Dr. George H. Found joined the engineering division of Arthur D. Little Inc., Cambridge, Mass., as senior staff member. Dr. Found previously was executive vice president and general manager of Saginaw Bay Industries Inc., and vice president of Magline Inc.

William H. Stewart was appointed Philadelphia district manager for Burroughs Corp.'s ElectroData Div.

OBITUARIES...

John Sanderson, 67, executive vilve president, Sperry Rand Corp., New York, died Dec. 7.

John W. Hodgson, 70, presidented Hodgson Foundry Co., Chicagass died Dec. 4.

Clinton H. Crane, 85, retired chai soman, St. Joseph Lead Co., New York, died Dec. 1.

Frank C. Farrell, 75, retired material ager of the Buffalo plant of Relipublic Steel Corp., died Dec. 1.

Edward E. Roberts, 53, assistan and purchasing agent, C. O. Bartlett Snow Co., Cleveland, died Nov. 22

H. J. Johnson, 59, vice presidented Belke Mfg. Co., Chicago, discub Nov. 28.

Isadore J. Behr, 56, president, Josephs Behr & Sons Inc., Rockford, Ill II died Dec. 2.

Samuel K. Frankel, 48, president Elgin Metalformers Corp., Elgin Ill., died Dec. 1.

Bernard T. Roe, vice president, Federal Enameling & Stamping Con Pittsburgh, died Nov. 27.

Victor H. Lawrence, 61, formed general superintendent of the Ott plant in Cleveland for Jones Laughlin Steel Corp., died Dec. at his home in Allison Park, Park He retired three years ago as vice president-industrial relations.

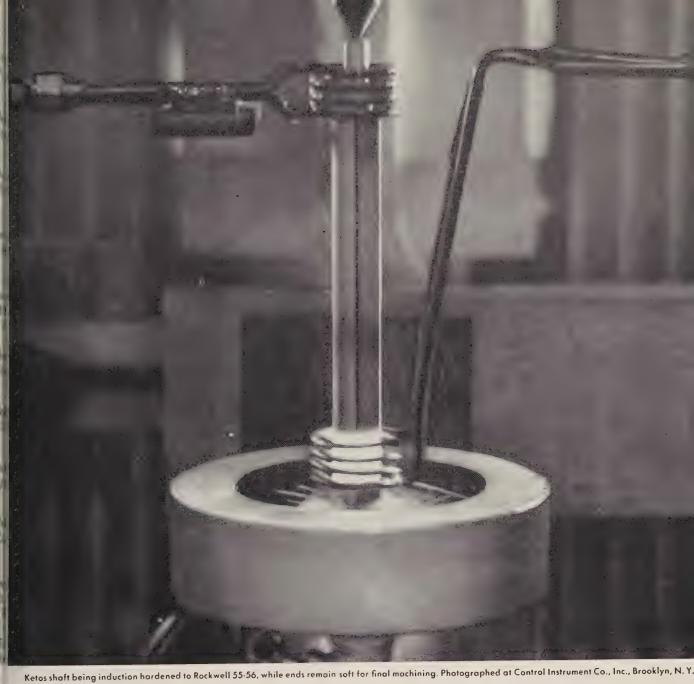
William R. Sorgel, 74, president Sorgel Electric Co., Milwaukee, diee Nov. 27.

Thomas R. Mullen, 65, president Lehigh Structural Steel Co., Allent town, Pa., died Dec. 2.

George S. Forbes, director of purchases, Century Electric Co., St Louis, died Nov. 12.

Philip Kerrigan Jr., 54, president Kerrigan Iron Works Inc., Nashi ville, Tenn., died Nov. 24.

Thomson Kingsford, 70, general manager, Kingsford Foundry & Machine Works, Oswego, N. Y. died Nov. 20.



KETOS has wide hardening range with minimum volume change...

Ketos is a low priced alloy tool steel that can be hardened from low temperatures with practically no volume change. It has deep hardening qualities, and a fine grained structure, that make it desirable for many production parts.

That's why nondeforming Ketos is well suited not only for most tool steel applications such as gauges, dies, and taps but also for close-tolerance, wear-resistant parts like the actuator bar shown in the induction heating unit above. The thin contact edges of this particular part withstood a "life test" of c 4-million high speed blows. No other steel tested lasted m than 1-million cycles before it chipped and failed.

If Ketos sounds like the steel you should be using, call y nearby Crucible warehouse. Stocks of Ketos and dozens other special tool steels are large, delivery fast. Crucible S Company of America, Dept. TL15, The Oliver Building, Me Square, Pittsburgh 22, Pa.

CRUCIBLE STEEL COMPANY OF AMERIC

Canadian Distributor - Railway & Power Engineering Corp., Ltd.



Charging some of the first T-ingots to arrive in the U.S. Photographed at independent aluminum fabricator—the Kawneer Company, St. Charles, Illia

To aluminum fabricators...

who value the importance of ingot design

As specialists in the production of high-quality aluminum ingot in almost every shape and form, Aluminium Limited research is constantly seeking ways to improve its ingot products to serve its customers better. Whether your ingot problem is a question of shape . . . dimensional tolerances . . . or alloy composition control, Aluminium Limited's engineers have the know-how to help meet your ingot fabricating or aluminum remelt requirements.

The T-ingot design is one of several recent developments that have brought savings to many customers in the U.S. Available in 750- and 1500-pound sizes, and shaped like a flattened T, these ingots have been specially tailored to speed handling by fork-lift trucks . . . have successfully reduced railcar unloading time up to 50%. Precision formed, T-ingots stack compactly, up to 10 high, with greatly im-

proved stability. For information about the T-ingot of aluminum in any other ingot form, call or write the neal est office of Aluminium Limited Sales. Inc.

Aluminium Limited

Ingot Specialist...serving
American Aluminum Fabricators

In the U. S.—Aluminium Limited Sales, Inc.
630 Fifth Avenue, New York 20, N. Y.
CLEVELAND • CHICAGO • LOS ANGELES • DETROIT • ATLANT

Additional distribution (Alcan Foundry Alloys): Apex Smelting Company, Chicago, Cleveland, Los Angeles Charles Batchelder & Company, Botsford, Conn.

See Omnibus . . . alternate Sundays, NBC-TV, 5-6 P. M., EST

More Companies Try Leasing

Conference Board reports that one-third of the firms it surveyed are renting more equipment and facilities now than hey did five years ago. Six advantages are cited

YOU CAN conserve working capial by renting needed equipment or facilities: That was the chief ourpose for leasing listed by 221 manufacturers surveyed by the Naional Industrial Conference Board. Some companies favor renting because it:

- Provides convenience and flexibility.
- Offers short term use.
- Helps avoid obsolescence.
- Simplifies the disposal of unneeded units.
- Eliminates maintenance problems.
- Offers certain tax advantages.
- More Rentals—About one-third of the companies surveyed reported that they rent more equipment and facilities than they did five years ago. Of the remaining two-thirds, 110 rent the same amount, and 33 did not respond. Seven companies indicated a decrease.

Warehouses, office equipment, automobiles, and trucks contributed to the increase. Car and truck rentals showed the greatest gain in the last five years. Though production machinery and machine tool rentals have picked up, they remain a small part of the volume.

The companies reported that it is sometimes advantageous to rent buildings to obtain desirable locations not available for purchase. Other factors: A move is easier to make when a site deteriorates, and if consolidation of plants is in the books, rented buildings might provide good temporary facilities.

• Drawbacks—Three general deterrents to the growth of rental practices were reported to the NICB. They are: Relatively high prices which many lessors impose as a safeguard against the hazards and added expenses of lease selling; more liberal depreciation allowances on owned property; and the uncertainty of potential tax benefits under certain leasing arrangements.

Products suitable for leasing are manufactured by 127 of the surveyed companies. Of those, 30 are already offering their products on a rental basis, and ten are considering the practice.

Nickel Firm Changes Name

Cuban American Nickel Co., a subsidiary of Freeport Sulphur Co., New York, changed its name to Freeport Nickel Co. The firm will operate a nickel and cobalt refinery at Port Nickel, La. To supply the refinery, Freeport Nickel's subsidiary, Moa Bay Mining Co., will mine and concentrate ores at Moa Bay, Oriente Province, Cuba. Beginning in the summer of 1959, Freeport will produce 50 million lb of nickel and 4.4 million lb of cobalt a year.

Enlarges Steel Stocks

Calbag Steel Warehouse Co. has established a \$750,000 service center at 3441 N.W. Guam, Portland, Oreg. With an additional 140,000 sq ft of floor area, the company has stocked 7000 tons of steel since mid-October when the facility was opened. It expects to increase the total to 11,000 tons within the next few months. The company's scrap and nonferrous metal operations will continue in quarters at 2495 N.W. Nicolai St., Portland.

Forms Industrial Park

Washington-Rockville Industrial Park, a planned science industry center, has been established in Montgomery County, Maryland, to meet the needs of science-oriented industries seeking accommodations at the nation's capital. Many new companies have located in the area and some of the older firms have established branch offices there.

Advantages claimed for the site include proximity to key government agencies; large research facilities; high concentration of scientific, engineering, and administrative personnel; and the strong marketing position of the national capital. A survey of the metalworking industry is being made to develop statistical data on site and building requirements to meet specific needs of companies in that industry.

Oxygen Steelmaking Gains

An oxygen steelmaking plant has gone into production at Sault Ste. Marie, Ont., as part of Algoma Steel Corp.'s expansion program. The two oxygen steel furnaces, rated at 60 tons each, will operate on a rotation basis, each producing more than 200 heats before needing a relining.

Installs Brazing Facility

Meridian Metalcraft Inc., Whittier. Calif., constructed a new aluminum dip brazing installation which is equipped for quantity production of aluminum assemblies, including the large sizes used in aircraft and missiles. The main brazing tank measures 36 x 36 x 60 in. in depth.

Builds \$9 Million Plant

Gates Rubber Co., Denver, is constructing a \$9 million manufacturing plant at Nashville, Tenn. The building will contain more than 500,000 sq ft of floor space and will house equipment to make tires. The firm expects to add facilities to make other products later.

Dedicates Research Center

General Electric Co.'s Lamp Div. dedicated its \$5 million lamp research center at Nela Park, Cleveland. Carl L. Olson, manager, says this marks the launching of an intensive pure research program aimed at "advancing the frontiers of knowledge of light production and its effect on all living things." The center houses three distinct research and engineering laboratories. The lamp research laboratory under the direction of John S. Saby is in-

(Please turn to Page 116)

Bob showed
them a
new product
that ended
rust on
work and
tools—



STANDARD Special Transparent Coolant

A CASE STORY ABOUT THE ADAMS COMPANY, DUBUQUE, IOWA



Before Standard Oil Jubrication speeialist Bob Wenger told The Adams Company management about Standard's SPECIAL TRANSPARENT COOLANT, here had been considerable trouble vith rusting of work and machines in he plant. There had also been trouble vith deposits on the ways of the grinding machines. Rust occurring on parts being processed was resulting in lamage and even losses. All of this as been changed.

'Since we changed to your Special **TRANSPARENT COOLANT, we have not** and any rusting or deposits on our nachine tools, and this product has eliminated the rusting problem on parts being processed through our plant," says Harlow Adams, president of the company.

The Adams Company found they received important additional benefits as well. Operators could now see their work clearly. There was less wheel loading. Because the coolant didn't foam, more of it stayed on the wheel resulting in cooler operation. Faster cuts were obtained with finer wheels. Finer wheels gave better finishes. Periods between dressings were extended. Work ran cooler and tolerances were maintained.

Research, development and more than two years of field testing have gone into Standard's Special Transparent COOLANT. This is the pay-out to you on the research done by Standard Oil to bring you better metalworking products. Find out more about Standard's Special Transparent Coolant. Call your nearby Standard Oil lubrication specialist in any of the 15 Midwest or Rocky Mountain states. Or write Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, III.



Bob Wenger (right), Standard Oil lubrication specialist, and John Charles Uthe, grinding room foreman, inspect grinding operation which uses new Standard's SPECIAL TRANSPARENT COOLANT, Bob Wenger is well qualified to go into the shop and make lubrication recommendations. He has been doing this sort of work for nine years. He has an engineering degree from lowa State College and, in addition, has completed the Standard Oil Sales Engineering School.

Quick facts about Special Transparent Coolant

- · Clear, transparent fluid.
- Able to control corrosion and rust on work and machines.
- All chemical. Does not support bacteria growth.
- Unaffected by humidity.
- Nonfoaming.
- · Fire resistant.
- Odorless.



and get it!

No rust. Shaft ground with Standard's SPECIAL TRANSPARENT COOLANT shows no rust on inspection by A. T. Murphy, General Superintendent, Harlow Adams, President, and Bob Wenger, Standard Oil lubrication specialist.

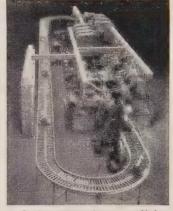
STEL from Wheelock, Lovejoy BULLETIN

W-L DETROIT For the first time, HY-TEN D-2 air hardening steel now available here in rounds, squares, flats and billets. Also a fine stock of standard alloy grades, especially A-8620, as well as all HY-TEN grades. Excellent service from our new warehouse.

W-L CHICAGO Steady demand for "B" No. 3X for flame-hardened parts such as boring bars. Good stocks of HY-TEN AIS—the best carburizing alloy steel, and freest machining available today—a new W-L exclusive!

Line-O-Dex transfer machine, designed and built by The Avey Division of Motch & Merryweather Machinery Co., Cincinnati, Ohio, is equipped with spindles made of our HY-TEN "B" No.

This grade was chosen for its great tensile strength (100,000 P. S. I. in the natural condition), touchness.



condition), toughness, and fine wearing qualities.

W-L CAMBRIDGE We are now distributing FLEXANGLE, the easy-toerect structure assembly for all types of racks, shelves, platforms, etc. It's completely universal and low in cost—can be used anywhere, by anyone, for any storage purpose.

W-L HILLSIDE Our stock of flat and square sizes in HY-TEN M
Temper Oil Hardening Steel can save you time and
money in your tooling program. HY-TEN "B" No.
3X pre-heat treated in rounds, squares and flats available in a wide range of sizes. Billets on hand for
hammer forging in all grades of HY-TEN.

W-L CLEVELAND Excellent stock of brake die flats and squares. Also many sizes up to 16" x 18" in HY-TEN Mold Steel. Excellent deliveries.

W-L BUFFALO A wide range of rounds and hexagons in cold drawn AISI leaded and non-leaded A-4140. Also many sizes of the new "B" No. 3X-40 in rounds and hexagons.

Write our Cambridge office today for your free Wheelock, Lovejoy Data Sheets. They'll give you complete technical information on grades, applications, physical properties, tests, heat treating, etc.



AGENTS: Southern Engineering Company, Charlotte, N. C.; Sanderson-Newbould, Ltd., Montreal & Toronto (Continued from Page 113)
volved chiefly in investigation introchemical and physical processes which give off light. The lamp engineering research laboratory under the direction of D. E. Elmendorf i concerned with the interpretation of scientific research findings and translating them into sound engineering practices. The radian energy effects laboratory under the direction of S. K. Guth is engages.

Metal Stamper Expanding

in the investigation of the effects of

light on man, plants, and animals

American Forging & Socket Con Pontiac, Mich., which recently became a unit of United Industrial Syndicate Inc., New York, is expanding its operations as a supplier of pressed metal stampings and assemblies to the automotive industry. Officers are: President angeneral manager, G. H. Rogers vice president, W. H. Graves; secretary, E. F. Barrett; and treasurer Harry B. Frazier.

Brush Beryllium Expands

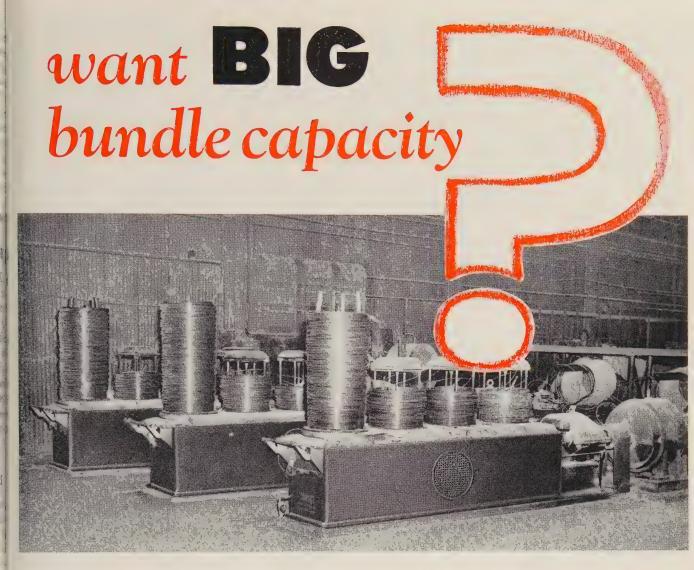
Brush Beryllium Co., Cleveland is expanding its rolling mill facilli ties at its Elmore, Ohio, plant. A building will be constructed to house additional cold strip mill fall cilities, additional machining car pacity for billet and slab milling and a major expansion of anneal ing facilities. Brush also will modify its present hot mill to permit rolling of wider beryllium sheets and provide additional facilities for the finishing operations on beryllium metal sheets. Cost of the program: \$250,000.

Rheem Moves Product Line

Rheem Mfg. Co., Chicago, will transfer steel shipping container production from Sparrows Point. Md., to its container plant at Linden, N. J. Rheem will continue to make home product items, including automatic storage water heaters, at Sparrows Point.

Builds Plant in Indiana

May is the target date for completion of Brown Trailers Inc.'s \$1.55 million plant at Michigan City, Ind. The firm is a division of Clarks



... then try MORGAN-CONNOR

wire machines. The Morgan-Connor Machine is a nonslip, continuous, dry wire drawing machine. Morgan machines will give you maximum weight bundles at the lowest possible cost.



MORGAN-CONNOR WIRE MACHINES

WM 110

MORGAN CONSTRUCTION COMPANY WORCESTER, MASS.

ROLLING MILLS • MORGOIL BEARINGS • WIRE MILLS • REGENERATIVE FURNACE CONTROL • EJECTORS • GAS PRODUCERS S. S. Rickley, Representative, 300 Cedar Blvd., Pittsburgh, Pennsylvania

December 15, 1958



Charlie Miller, Purchasing Agent, The American Welding and Manufacturing Co., Warren, Ohio, tells:

How a G-E vacuum-melted alloy helped solve the problem of fabricating super-hard jet engine rings

"At American Welding it's our business to make jet engine components to exacting specifications. Some of the materials we use are difficult to fabricate. René 41 is a case in point. We were getting many rejects on rings of this material, making it hard to meet delivery schedules.

"In looking for a solution to this problem, we placed an order with the Metallurgical Products Department of General Electric. We felt that G.E., with more than 10 years' experience in vacuum-melted alloys, could help us . . . and they did. They supplied us with vacuum-melted René 41 that met high physical and mechanical

specifications. Fabrication problems were quickly solved by our metallurgical and production men with assistance from G-E metallurgical engineers.

"Now we are delivering these precision jet engine rings on schedule . . . and rejects have been practically eliminated."

Whatever vacuum-melted alloys your specifications call for, you too can profit from General Electric's leadership in this field. For facts about the complete G-E vacuum-melting service and facilities write: Metallurgical Products Department of General Electric Company, 11141 E. 8 Mile Street, Detroit 32, Michigan.

Progress Is Our Most Important Product



Equipment Co., Buchanan, Mich. Brown is increasing production of aluminum trucktrailers and cargo van bodies and will produce a new line of all-steel and steel-aluminum trailers. It will close its plant in Elgin, Ill., when operations begin in the new facility. Other plants are in Spokane, Wash., and Reading, Pa.



CONSOLIDATIONS

Gate City Steel Inc., Denver, purchased Moffett Engineering Inc., Albany, Calif., designer and builder of cranes. Gate City Steel is a subsidiary of Husky Oil Co., Cody,

Hammond Valve Corp., a subsidiary of Consolidated Diesel Electric Corp., Stamford, Conn., is purchasing Hammond Brass Works Inc., Hammond, Ind., maker of bronze valves.

Heifred Co. purchased Hustler Corp., producer of electric lift trucks. Both firms are in Willoughby, Ohio. Management of the consolidated firm, Heifred Corp., is headed by Henry Hein and Zigmund Fredericks.

Topp Industries Inc., Los Angeles, is acquiring U. S. Semiconductor Products Inc. and U. S. Electronics Development Corp., both of Phoenix, Ariz. The affiliate companies make diodes and other semiconductor devices, tantalum capacitors, and basic silicon materials for infrared applications.

Dynamics Corp., Los Turbo acquired Huber Tool Angeles, Works Inc., San Carlos, Dr. W. O. Davis, a nuclear physicist, will manage the Huber plant which produces electronic components, gages, and other equipment for the electronics industry.



Metal Stamping & Processing Co. has completed a \$225,000 plant at 3900 12th Ave. N., Birmingham, (Please turn to Page 122)



NUT RUNNING TOOLS

- you run down thousands of nuts every day, or just a few -
- you use one size or several sizes of nuts -
- you use hex, square, self-locking, castellated or any other kind of nuts -
- you work with brass aluminum, stainless steel, monel, bronze, nickel alloy nuts, or any type of special fasteners -
- you use manual or power tools, or even multiple units to run down nuts -

THFN

you can certainly use Apex standard or magnetic nut running tools specifically designed for your nut running work. For most applications, simply select the correct Apex tool from more than 5,000 stock types and sizes. For special applications, just ask Apex the authority on fastening — for practical assistance in solving your problem.

Write, on your company letterhead please, for Catalog 30-A (tools up to 5% drive), or Catalog 30-B (tools 3/4" drive and larger).

A Quarter Century of Service to Industry 1933

1958



1032 S. Patterson Bivd. Dayton 1, Ohio

100 E screwdriving nut running FASTENING

119

When you buy from U. S. Stee



STEEL_PLUS IN ACTION: FACILITIES

You're looking at the largest lock-coil cable in the world. It was specially designed and built by U.S.Steel's American Steel & Wire Division for the main tramway used in construction of the Glen Canyon Dam in Arizona. Construction crews have nicknamed it "the main gut," because it will carry the concrete and steel that are placed in the dam. The cable is four inches in diameter, has 312 individual steel wires and weighs 38 lbs. per foot. It took complete manufacturing facilities and know-how to produce this unique construction link.

STEEL_PLUS IN ACTION: TECHNICAL ASSISTANCE

When Blaw Knox Company made nose plates for open-grate stair tread, they cut sections from flat plates and bent them into shape—an operation that often cracked the plates and left them for scrap. U.S.Steel offered a special angle section with a raised tread already rolled on the top side. This eliminated shearing and forming operations and stopped the scrap waste. The new nose plates are simply cut to length and welded to the grate—at a substantial saving in fabrication and steel costs.



you get STEEL_PLUS







STEEL_PLUS IN ACTION: MARKETING ASSISTANCE

Sales of major appliances were never very high during the Christmas selling season-until 1954 when U.S. Steel launched the first annual Snowflake promotion. Since then, Christmas-time appliance sales activity has climbed steadily as a result of this newspaper, magazine, radio, and TV campaign to promote major appliances as Christmas gifts. Hundreds of retailers and manufacturers have used the Snowflake campaign as a master plan. They built their own promotion program around it, using sales kits and aids provided free by U.S.Steel.

STEEL PLUS IN ACTION:

With an electrical current, this emission spectrograph vaporizes samples of metal. The emitted light spectrum is analyzed to reveal the exact amount of the important elements present in the sample. This type of test on the strip used for tinplate helps U.S.Steel research teams maintain the consistent high quality of tinplate, and guarantees top protection for products packed in steel cans.

USS is a registered trademark

American Bridge • American Steel & Wire and Cyclone Fence • Columbia-Geneva Steel • Consolidated Western Steel National Tube • Oil Well Supply • Tennessee Coal & Iron • United States Steel Homes • United States Steel Products United States Steel Supply and Gerrard Steel Strapping • Universal Atlas Cement • United States Steel Export Company



December 15, 1958



Ordinary spring and Strippit Hydra-Spring of equivalent force.

equal stripping power in 1/6 the space

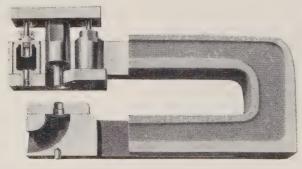
to cut your heavy-duty tooling costs!

Where high stripping pressures are required due to size and type of work or thickness of stock, Strippit Hydra-Springs are the answer. Utilizing the compressibility of liquids, Hydra-Springs develop up to six times the force of equivalent mechanical springs, greatly reducing the number, travel and size of stripping units required.

Impressive economies through Strippit flexible multiple-unit press setups

Like the Strippit, the Hydra-Spring is used in the Strippit line of independent, self-contained, self-stripping punching units. This is the tooling system that breaks the time and cost barriers of fixed perforating dies by permitting simple bench assembly setups...all but eliminating press down-time whether it's a long production run, a pilot run for design changes or a "repeat" run later on. No burring necessary, of course.

WHATEVER YOUR PIERCING OR NOTCHING APPLICATION, don't miss the major savings so many industries are enjoying with flexible Strippit tooling. Write today for full details, and if you wish, a demonstration at your plant by a mobile Strippit unit.



Using Hydra-Springs for the heaviest duty work, the Strippit line of hole punching units offers a complete range of capacities up to ¾" in mild steel. A full stock of quick-change standard tools or "specials" made to your order. Warehouse stocks in Chicago and Los Angeles.

WALES STRIPPITCOMPANY

210 Buell Road . Akron, New York



Manufactured in Canada by Strippit Tool and Machine Limited, Brampton, Ontario

(Continued from Page 119)

Ala. It has 15,000 sq ft of floored space. Construction of an office building is nearing completion. Plant facilities include high speed stitting machinery capable of cutting steel coils weighing up to 40,000 lb, decoiling, leveling, and edging equipment. The company was organized by Ferro-Alloy Corp., Chicago, and Metal Stamping Co., Birmingham. Robert F. Comer is president.

Hanchett Mfg. Co., Big Rapids, Mich., and Portland, Oreg., constructed a branch factory, office, and warehouse at Fifth Avenue Stand 31st Street, Birmingham, Ala. The firm makes grinders, saw sharpeners and swages, and swages shapers.

Canadian Canners Ltd., Hamilton, Ont., is constructing a can manufacturing plant at Burlington, Ont. It will be completed by March and should be in partial operation for the 1959 packing seasons beginning in June.

Pneumafil Corp., steel and nonferrous metal fabricator, has leased 35,000 sq ft of space in the former Kendall Mills plant in Thrift, N. C., to expand its production facilities. Operations will be continued at its present plant in Charlotte, N. C.

Alabama Metallurgical Corp., jointly owned by Calumet & Heclas Inc., Chicago, and Brooks & Perkins Inc., Detroit, has started works on the site for its \$3.5 million magnesium plant near Selma, Ala. It will have an initial capacity of 60000 tons a year. The metal will be produced from dolomite mined from a company owned deposit at Ryan., Ala.



Jones & Laughlin Steel Corp., Pittsburgh, opened a resident saless office at 108 Arlen Bldg., Midland, Tex. The office is under the direction of D. M. Griffith, Houston district sales manager.

Detroit Steel Corp., Detroit, opened a district sales office at 3700 East Ave., Rochester 18, N. Y. R. S. Cummins, manager of sales, is in charge. The firm also opened a Mil-

"Sweet little money-maker... before we put the wheels on!"



Funny joke! But the boss is not amused.

His company supplies the body of that cart to other manufacturers — successfully, too. Just recently he decided to market a model of his own, complete with wheels. Yes . . . they're selling fast. But the company's losing money on every shipment.

What happened? With late and inadequate cost reports on that wheel assembly, the price was set too low. Weeks passed before the boss found out. And it'll be weeks more before his profits stop taking a licking.

How different with Automatic Keysort punchedcard controls! With Keysort's meaningful *on-time* job-cost summaries, management would have known how costs were running at every stage . . . could have acted *fast* to keep them in line. Thus, price could have been set to *cover* cost . . . and the new product marketed with a healthy profit included.

Automatic Keysort is today's only data processing system that provides automatic creation and processing of original records. Speeding vital day-to-day and long-range facts essential to sound management, this unique system employs simplified machines and methods which can relieve your personnel from many routine clerical functions.

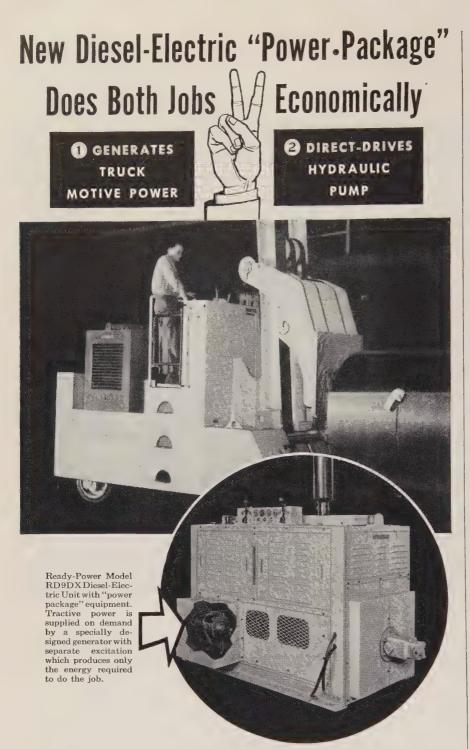
With the Automatic Keysort System, manufacturing concerns of every size can now enjoy fast, accurate data processing on either a centralized or decentralized basis. At remarkably low cost... without restrictive, complex procedures... without specialized personnel.

Call your nearby Royal McBee Data Processing Representative, or write Royal McBee Corporation, Data Processing Division, Port Chester, N. Y. for illustrated brochure F-2.

ROYAL M°BEE · data processing division

NEW CONCEPTS IN PRACTICAL OFFICE AUTOMATION

December 15, 1958



Ready-Power makes diesel-electric power doubly effective with a newly developed "power package" designed specifically for use with its "RD" Series Power Units. This remarkable new concept allows the unit to operate at *constant speed*, no load to full load, yet supplies full range of tractive power on demand and produces continuous hydraulic power without need for intermediate electric motors. The last word in simplicity, this new "power package" eliminates contactor failure, minimizes maintenance, assures maximum operating economy for electric trucks up to 200,000 lb. capacities. Write for complete information.

READY-POWER

The READY-POWER Co., 3824 GRAND RIVER AVE., DETROIT 8, MICH.

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electic Power Units for Industrial Trucks waukee sales office at 8531 W. Capitol Dr. W. V. McClelland, customer representative, is in charge.
Richard E. McCabe has been promoted from sales representative to
manager of sales, Grand Rapids.
Mich., district sales office.

Arnold Engineering Co., Marenday, go, Ill., formed a new Ohio-areases sales district with headquarters in the Carew Tower, Cincinnati, Ohio, bit District manager is A. L. Snyder. The firm also established a sales engineering office at 8905 Lake Ave., So Cleveland, Ohio. James Borst is in the Charge. The company makes magnetic materials for industry.

Alvey-Ferguson Co., Cincinnati, i opened a direct factory branch of the fice in Philadelphia. It's under the management of James R. Keogh Jr. The firm makes conveying systems and equipment.



NEW ADDRESSES

Beryllium Corp., Reading, Pa., moved its Detroit sales office and warehouse to 5649 Van Born Court, Dearborn, Mich. Dale J. Richards is district sales manager.

W. L. Maxson Corp., New York, moved its Instruments Div. to 475 Tenth Ave., New York 18, N. Y.

Sherman Car Wash Equipment Co. moved its plant and offices from Detroit to Broad Street and Publica Road, Palmyra, N. J. F. W. Thacher Jr. is president and general manager.



ASSOCIATIONS

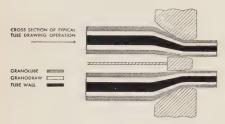
Society of Aircraft Materials & Process Engineers is being formed to meet some of the requirements of the Space Age. Temporary officers of the Eastern Division, are: President, G. E. Holback, Martin Co., Baltimore; vice president, T. P. Pajak, Narmco Industries Inc. Womelsdorf, Pa.; secretary, Jay M. Stevens, Bureau of Aeronautics, Washington; treasurer, John S. Thorpe, Allegheny Ludlum Steel Corp., Pittsburgh. Membership will include engineering personnel of the aircraft and missile industries and companies serving these industries.



CHEMICAL CONVERSION COATINGS and their functions in facilitating the cold mechanical deformation of metal:

By ARTHUR DAHL, Product Development Dept., AMCHEM PRODUCTS, INC.

When used to facilitate the cold mechanical deformation of metals (in drawing, extrusion, stamping, cold heading, necking, and upsetting operations) chemical conversion coatings in conjunction with suitable lubricants perform three important functions. One, they prevent metal-to-metal contact between work and tool. Two, they prevent galling and seizing. Three, they protect stock indefinitely, permitting the storage of in-process work at any stage of production, without danger of corrosion damage.



Characteristic of the tightly bound, highly absorptive, crystalline coating formed by the processes is the ability of the coating to retain lubricity throughout forming operations when treated with a suitable lubricant. This offers the following production advantages:

- Higher degree of reduction
- Greater speed of draw
- Longer tool life
- Fewer process anneals and pickling
- Finer surface finish
- Cleaner mills
- Easier inspection of finished product

Also of interest to production men is the exact duplication of coatings from batch to batch. And the processes are much simpler than other methods of coating metals—baths can be set up and running in less time than it takes to determine suitable coatings by other methods.

TYPES OF COATINGS AND THE METALS FOR WHICH THEY ARE DESIGNED

Zinc phosphate coatings for carbon steel. These coatings can be applied by either dip or spray systems.

ACP Granodraw No. 1 is typical of the dip process. The sequence includes precleaning, water rinse, pickling, water rinse, water rinse, Granodraw No. 1 solution, water rinse, and a hot neutralizing rinse. Surfaces to be treated must be free of oil, grease, rust and scale. The above sequence insures that they will be. And when metal is free of rust and scale, the pickling bath and two succeeding water rinses can be omitted. In either case, a lubricant like ACP Granolube or conventional lubricant must be applied prior to working the metal.

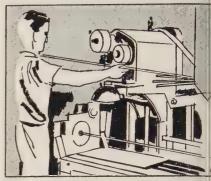
Spray. ACP Granodraw No. 4 is an example of the spray process. It usually requires 5-stage equipment and includes the following steps: precleaning, water rinse, Granodraw No. 4 solution, water rinse, lubricant. After chemical treatment, the work must be dried before forming.

Oxalate Coatings for the stainless steels and many of the high nickel alloys. These coatings are applied only by immersion process, and usually in a 5-stage system which includes an acid pickling or depassivating bath, a water rinse, the ACP Granodraw SS coating bath, a hot borax neutralizing rinse for wire stock, or a lubricating bath for tube stock. Since thorough activation of the metal surface is necessary to promote an adherent coating, the pickling and activating bath is an important stage in processing.

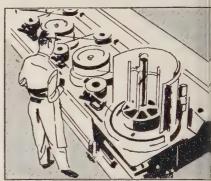
Fluoride-type coatings for zirconium and its alloys. Granodraw ZR is such a coating. It is applied in an immersion process which includes precleaning, water rinse, pickling, water rinse, Granodraw ZR solution, water rinse, drying or lubricating. It has been used primarily in the treatment of stock prior to wire drawing and tube drawing. Surfaces are cleaned of oil and grease by solvent degreasing or alkali cleaning. Pickling is required to provide a surface that is chemically and metallurgically receptive to the coating.

Strong alkali coatings for Yantalum and amorphous phosphate coatings for aluminum. These two types of coatings are now in the development stage. Laboratory and field tests are being conducted, results are being evaluated, and modifications in chemical makeup and process sequence are being made to meet requirements. Several field tests, however, have indicated that they will do the same job for tantalum and aluminum processors as the other types of coatings have done for those working carbon steel, stainless steel. high-nickel alloy, and zirconium.

For more information write us at Ambler.



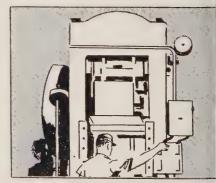
Tube Drawing



Wire Drawing



Cold Heading



Impact Extrusion

Amchem Products, Inc. Ambler 19, Pa.



DETROIT, MICH. • ST. JOSEPH, MO. NILES, CALIF. • WINDSOR, ONT.

New Chemical Horizons for Industry and Agriculturer

Technical Outlook

December 15, 1958

MACHINING TIPS— Have trouble keeping long run machined parts within size limits, or maintaining surface finish tolerances? A study at the University of Michigan shows that size is influenced by tool feeding forces, which may rise some 20 times during a normal run of parts on automatic screw machines. Surface quality is a function of nonuniform tool wear. The findings mean that you can't predict performance with a brief, sharp-tool test. Also, they support the practice of a close watch for tool wear—a fast tool change before extreme wear occurs.

NOW IT'S PLASMA POWER— Metal strips separated by ionized gas (called plasma) produce electricity when heated, say research people at the University of California. The idea is a takeoff on thermocouples. Potential efficiency is around 30 per cent. At first, they'll be used with nuclear powerplants.

NEW GOALS FOR METALS—High temperature curiosity is undiminished. Many laboratories report they're designing equipment to test physical reactions at 3000° F.

ULTRASONIC SEAM WELDING— Westinghouse has an experimental device that fuses metals with high frequency sound waves. These advantages are claimed: No electric current is applied to the parts; no cleaning or surface preparation is needed; dissimilar metals are easily joined. Dr. C. E. Arntzen, department manager, says that it shows "real promise of being a practical, production technique."

AEC WATCHDOG—Fabricators of atomic fuel elements, reprocessors of enriched scrap, and those who convert uranium hexafluoride to oxide and metal now must maintain special alarm systems to check the accidental accumulation of harmful amounts of radioactivity. It is possible,

although unlikely, say atomic energy commissioners, to produce harmful radiation in a working area if you're in one of those businesses. Those who have small quantities of the material aren't affected by the requirement.

PRAISE FOR QUARTZ LAMP BRAZE—Stainless and titanium honeycomb are joined faster with a new method that employs thin heat lamps enclosed in quartz tubes. It marks another milestone for such lamps which every day find their way into more industrial processes. The method was developed by Armour Research Foundation, Chicago. Grumman Aircraft, Bethpage, N. Y., and Twin Coach Co., Buffalo, are licensed to use it.

RUBBER WITH LONGEVITY— Tires on pallet trucks will wear four times longer than today's standard product when they're made of the new polyurethane rubbers. One maker, Goodyear, attributes such performance to better resistance to cutting, chipping, and chemical attack.

METAL SPINNING RESEARCH— The University of Michigan, under the sponsorship of the Army's ballistic missile agency, is investigating what happens to metal when it's formed by spinning. Researchers are using brass and aluminum sheets spun into cones of various sizes. They want the facts on tensile and yield strengths, ductility, surface hardness, and a rundown on changes in the microstructure.

WELDING IN VACUUM— Try welding in a vacuum instead of a protective atmosphere, recommend J. A. Stohr and J. Briola, Commissariat a l'Energie Atomique, Saclay, France. Advantages: Better control of working pressures; freedom from gas handling problems; the heat affected zone is quite small, reducing distortion; and it's a cheaper way to make high quality welds. The Frenchmen use electronic beam welding.



The sparks fly as a ceramic tool cuts steel at 16,454 sfpm

You Can Make Ceramic Tools Pay Off

A 30-month research project uncovers some ground rules that will help. Two suggestions: Use an edge land on the tool, and avoid short, interrupted cuts

WHEN you put ceramic cutting tools on production machining jobs, you can have fantastic success or an epidemic of trouble. Here are ten guideposts that can help you

get the most out of ceramics in your plant.

They are the products of a $2\frac{1}{2}$ -year study at Ohio State University, sponsored by Warner & Swasey

Co., Cleveland. Prof. H. D. Mood and Dr. D. R. Kibbey, department of industrial engineering, were charge. These points, they suggest must be considered if ceramics at to pay off in production.

1. They work best on long, uninterrupted cuts.

Varying the cut length, OSU n searchers found that the longer the cut (the fewer the starts), the be

Research Points Up Future for Ceramics

"Ceramics were introduced with a flare and glamor that has left some people doubting their practical potential. The doubts are particularly strong when users try the tool material and it fails—despite published claims and known work on ceramics by the Russians," says R. T. Hook, chief metallurgist, Warner & Swasey Co., Cleveland.

"The study reported in this article was sponsored by Warner & Swasey to find out as much as possible about the role of ceramics in the future—to provide our own shop with information which would permit the early introduction of this cutting tool material to its proper application, and to serve our customers who need further information about the use of ceramics.

"No thought was given to prior cutting materials, such as carbides, when the test was undertaken. The use of statistical analysis to confirm the significance of the data collected is probably a 'first' in metal cutting research.

"OSU's Professor Moore has stated he feels that if the carbides had gone through a thorough study of this kind when they were first introduced, industry might have saved billions of dollars spent by thousands of people in their own cut-and-try research. This ceramic test, and others like it, should accelerate the rate at which the new material is adopted as an efficient production tool.

"The use of land angles, as recommended by Professor Moore and Dr. Kibbey, is an outstanding contribution to industries learning how to make ceramics work. The fact that they have found a wetting takes place between the ceramics and the workpiece (Steel, Oct. 7, 1957, p. 168) is startling. Most writers have concluded that ceramics do not have any affinity for the work, particularly in steel.

"Some of the outstanding applications for ceramic cutting tools are:

"1. As a finish turning for uninterrupted cuts.



R. T. HOOK, chief metallurgist, Warner & Swasey Co.

"2. On hard materials that resist cutting by other tool materials,

"3. On abrasive materials, such as cast iron, where ceramics have great resistance to wear.

"4. As a replacement for some grinding operations (particularly on materials 40 Rc and higher) because of the improved surface finishes ceramics will produce at the higher speeds they can take."

the tool life. In three tests, the ults were: In 25 short passes, cutters removed only 7.9 cu in. metal before they were worn; in slightly longer cuts, 39 cu in. of tal were removed before tool lure; in nine long cuts, the tool noved a whopping 63 cu in. bee failure.

The time for major tool wear or lure is nearly always during some tial contact with the work raththan during a cut. Over 95 per it of all tool failures were at, or ar, the point of initial contact.

2. The higher the cutting speed, shorter the tool life.

Ceramics behave like all other ol materials when it comes to

the speed-life ratio, but speed has less effect on ceramics than on most other tool materials. With the materials used (mostly SAE 1045), speeds in the 500 to 1500 sfpm range are practical, varying with the tool geometry and depth of cut. The life of a ceramic tool at 1500 sfpm is about equal to that of a carbide cutter under similar conditions at 500 sfpm.

3. An edge land is a must. It may be the key to roughing cuts.

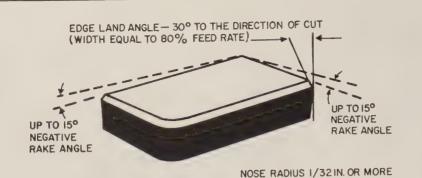
The engineers reported: "By far, the most important discovery to date has been the effect of . . . an edge land on the tool." Sharp edges tend to chip or to flake, particularly on deep cuts. Edge lands

reduce the tendency to chip, and they permit higher feed rates (as high as 0.037 in. a revolution at 1000 sfpm). The ideal land, extending around the side, radius, and front of the tool, is a rounded edge, polished, with a radius no larger than the feed (chip thickness).

As a compromise between an ideal land and one that's easy to generate, try a flat one, sloping at 30 degrees to the cutting direction, with a width equal to about 80 per cent of the feed distance.

4. With sharp edged tools, life is doubled when the cutting starts are slow.

The report states: "With a



This tool geometry makes a good starting point for efficient cutting. Although factors like speed, feed, and depth of cut may change your specific needs, tests conducted at Ohio State University proved this design to be basically sound

rounded cutting edge, starting speed has almost no effect. With a sharp cutting edge, slow starts give a definite improvement in tool life. It should be noted that even with slow starts, the rounded edge performed better than the sharp edge."

To avoid chipping of sharp tools, start and stop the cut at lower speeds than you use in the main portion of the cut. Slow starts were tried at 200 sfpm, fast starts at 1000, 1500, and 2000 sfpm.

5. For machining steel, double negative rakes probably are better than positive rakes.

When using brittle tool materials, such as ceramics, positive rake angles contribute to edge chipping and fracture. Within the proper range, say 0 to -15 degrees, variations in rake angles have only small effect.

6. Use a nose radius which is as large as possible.

It should be larger than the cut depth when practical but not large enough to induce chatter and vibration. The report says: "Large nose radii are desirable for increased tool life regardless of the edge shape used as long as chatter doesn't develop. This has been proved true with sharp edges, flat edge lands, and edge radii."

7. Grind marks and scratches on the tool surface shorten its life.

Visible marks should be removed. Photomicrographs show that failure is primarily a grain-by-grain process. It seems reasonable to believe that if no corners or sharp grain edges project above the mean surface of the tool, the failure process might be slowed down.

Tool tips were polished by rubbing them against a leather pad covered with a mixture of 600 grit boron carbide and oil.

8. For best tool life, start the cut into a shoulder that has been finish machined.

The better the finish on the starting surface or shoulder, the less chipping of the cutting tool you're likely to get.

9. Relief angles should be less than 20 degrees.

Within the range of 5 to 15 degrees, changes in relief angles have little effect.

10. Medium-hard steels can be cut at good speeds.

Steel in the 200 to 500 Brinell range was cut. The report states: "Satisfactory cutting was accomplished on 500 Bhn 4150 steel at speeds as high as 500 sfpm. Also, 300 Bhn 4150 cut well at 1500 sfpm with the same tools, using the radius edges in all cases."

• Conclusion—Don't give up if you try ceramics on a job that seems a natural, then run into short tool life, advise Professor Moore and Dr. Kibbey. Give careful consideration to the many variables that affect life, including two things not mentioned above: Unequal clamping stresses and vibration.

The investigators conclude: "It is possible that a simple correction will permit the ceramic tool to become extremely valuable."

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, Steel, Penton Bldg., Cleveland 13, Ohio.

Antifreeze May Harm Aluminum Auto Engine

The possibility of more I metals in auto engines and compositions may pose new antifracorrosion problems.

Leonard C. Rowe of General tors Corp., points out that a freezes and rust inhibitors that vent corrosion in present autogines and cooling systems may be preventives in aluminum gines or radiators. He anticiprojetting and galvanic corrosion gardless of how extensively alumum is used.

He warns that either chem manufacturers must be prepared provide materials which are estive in a light metal cooling syst or alternative methods of cool must be found.

He suggests that the chemicall dustry initiate research prograto study the effect of water quaron corrosion and inhibition, the fect of heat transfer on metal crosion, and the effectiveness of hibitors in crevices and low veloc coolant area. He also suggests search might be done on the effon corrosion of service variables such as poor maintenance, as freeze re-use, and driver habits.

Bath Dissolves Porcelain

You can reclaim porcelain end eled rejects in 5 to 15 minu through the use of a chemical poess known as Kolene denamel, veloped by Kolene Corp., Detro

The process removes all traces porcelain without attacking base metal. Costly blasting a lengthy soaking operations are necessary. A water rinse after i mersion in the chemical is all than eeded to make a panel ready re-enameling.

A typical installation contact the chemical bath, controlled maintain the necessary 900 to 95 F temperature, and a water rintank. Mechanical agitation of the bath insures good heat transfer, oculates sludge, and controls sludgettling.

Kolene says it will predetermit exact time cycles and handling procedures for buyers of the equipment.



minum panels, fastened with screws of the same material, cut weight and intase corrosion resistance in this truck cab. Inset: Typical sheet metal screws

Numinum Screws Cut Costs

By FLOYD A. LEWIS

Technical Secretary Aluminum Association New York

Last in a Series

The first article discussed aluminum rivets and their uses. Topic of last week's article was aluminum bolts, machine screws, and washers

OW TO MAKE better sheet aluinum products and trim manufacring costs: Where sheet metal rews are called for, fasten with uminum. Here's why: Aluminum screws are strong enough to develop the full strength of the joined parts. They are light, corrosion resistant, and give the products a uniform appearance. Low material cost and easy installation reduce manufacturing costs.

• Eliminate Tapping—Sheet metal screws are simply driven into drilled or pierced holes of the proper size; they require no costly tap-

ping, but provide a secure threaded fastening.

The hole should be slightly smaller than the major diameter of the screw; it must be small enough to permit maximum holding power, yet large enough to prevent thread damage.

• Harder Alloys Used—Since the screws displace the metal into which they are driven, they must be harder and stronger than the metal being joined. They are limited generally to use with the softer aluminum alloys.

They cannot be used to join 2024-T4 sheets (the screws themselves are made of that alloy and in that temper).

• Two Types Available — Type A (gimlet point) screws are used for fastening lighter gages of sheet aluminum, Type B (blunt point) for heavier gages of sheet aluminum, extruded sections, or castings.

Both types are available in several head styles, with a choice of slotted or cross-recessed heads.

- Applications Many products made from aluminum sheets and extrusions—from toys to larger products, such as heating ducts or buses—are assembled with aluminum sheet metal screws.
- Three Types of Washers—Plain washers protect parts from mechanical damage, spread load over a wider area, or improve appearance; finishing washers are used to dress up the product; and spring lock washers permit vibration-resistant joints to be made entirely of aluminum.
- Take Many Finishes—Mechanical, chemical, or electrochemical finishes may be applied to the fasteners; they may also be painted, enameled, or lacquered. Often they are anodized to increase resistance to corrosion, abrasion, or wear.

Dye is often used on fasteners to identify alloys; when products are finished after assembly, exposed surfaces of fasteners are given the same finish as other aluminum parts to preserve uniform appearance.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, Steel, Penton Bldg., Cleveland 13, Ohio.

JOB:

Clean and refill grinding machine sump tanks.

It used to take 3 manhours. Now, with the cleaner shown at right, the job is done by one man in 30 minutes.

Saved: 21/2 manhours every time a machine iss cleaned.

Also, since all cleaning is done on a 30 minute break, maintenance no longer cuts into production time.

Two machines are cleaned once a week; another high production grinder is cleaned three times a week.

Total savings for the five cleanings: 12½ maintenance manhours a week and 5 production hours on the machines.

How We Beat the Cost Crisis



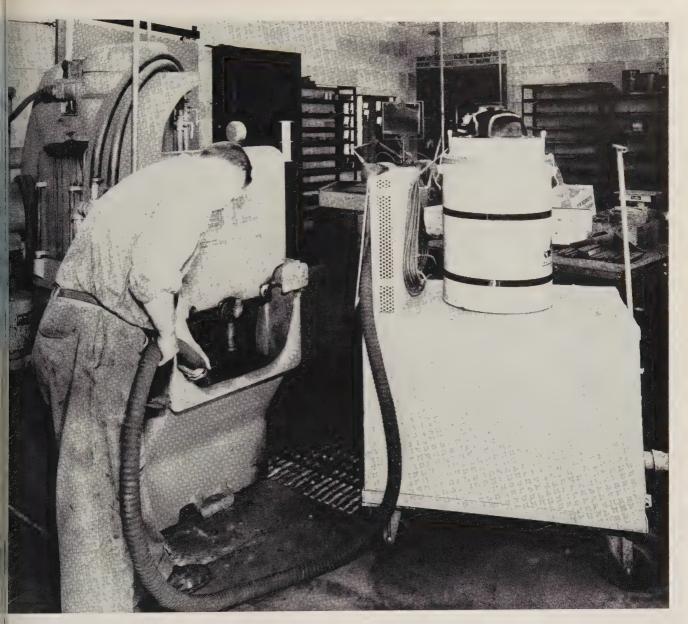
Machine Service Unit Gets Rid of Costly Downtime

This homemade maintenance machine cost only \$300. Company now can drain, clean, and refill grinding machine sump pumps during a 30 minute lunch break. This is one of the top entries in the Cost Crisis Awards Competition conducted by STEEL. Another will be published next week

HALF the cost battle is won of some production lines when you figure how to keep the maching running. It means eliminating, at least minimizing, budget-shattering downtime.

Here's how Adamas Carbic Corp., Kenilworth, N. J., solved the problem. A homemade vacuum tank has eliminated all the productive downtime formerly required the service the coolant sumps on two No. 11 Blanchard surface grinders

• No Time—The machines are operated on a three-shift basis. Cook ant tanks have to be emptied cleaned, refilled, and additive added. The only way to avoid interrupting production is to do the join



In 20 minutes, the machine sump will be empty—ready for refill

n a 30-minute lunch break.

Gerard Scheyer, plant engineer, ays: "We tried mechanical pumps of all types, but the diamond and arbide particles in the coolant wore them out in less than one application. On top of that, the operation took two men at least an anour and a half—an hour of which was production time."

Solution—Engineers investigated racuum sump cleaning and decided o build their own unit. They started with a reinforced tank and industrial vacuum cleaner.

The cleaner is mounted into the op of the tank. A 1½ in. opening cut into the tank side serves as an inlet for the suction hose.

The maintenance man immerses the end of the hose into the grinder sump tank and turns on the vacuum pump. It takes 20 minutes to drain the sump tank, 5 minutes to wash it out, another 5 minutes to refill it. Total time for the one-man job: 30 minutes.

A refinement was added, Mr. Scheyer told Steel. Fresh water was piped directly to the machines, speeding up flushing and refilling.

• Reclaim—A valve is mounted 3 in. above the floor of the service tank. After the maintenance man has allowed enough time for the sludge to settle, he drains the vacuum tank. When he sees the water begin to run cloudy, he knows

enough sludge is in the tank to require cleaning.

- The Payoff—Since each of the two Blanchards must be cleaned once a week, the new service unit saves the maintenance crew 5 hours a week. The old method robbed production of an hour a week on each of the two machines.
- Extra Duty—The unit is used to service a high production Besly-Welles grinder that has to be cleaned three times a week.

It also offers an improved method of reclaiming tungsten carbide and diamond particles, accounting for an over-all saving of 35 per cent in diamond wheel costs.

Fibrous Material Keeps Out the Heat

Formed into shapes or spread on with a trowel, it has almost four times the insulating value of commercial firebricks at comparable temperatures, and is lighter

DIFFICULT insulating problems may be solved by a new material that is not only light but has excellent resistance to heat.

Called fibrous potassium titanate, the product is a compact mass of white crystalline fibers. Because of the small diameter (less than 1/25,000 in.) and high reflectance of the fibers, the material blocks heat penetration by scattering incoming infrared rays.

• Being Evaluated—The material was developed by the Pigments Dept. of E. I. du Pont de Nemours & Co. Inc., Wilmington, Del. It is being produced on a semiworks scale at the firm's Newport, Del., plant. A decision to manufacture commercial quantities must await results of evaluation studies.

Fibrous potassium titanate appears best suited for applications where space and weight are critical, explains Dr. J. B. Sutton, specialty products sales manager of the Pigments Dept. In the 1300 to 2100° F range, it is about twice as effective on a volume basis as any known insulating material, he says.

As a thermal insulator at high temperatures, the material may offer construction advantages for rockets and missiles, aircraft, and atomic-powered vehicles. Suggested, but as yet untried, uses include insulation for missile nose cones and rocket combustion chambers.

Other suggested applications include electrical and acoustical insulation, reflective shielding for heating units and ovens, gaskets and packing, filters, fire blankets and protective clothing, high temperature paints or coatings, and plastic reinforcement.

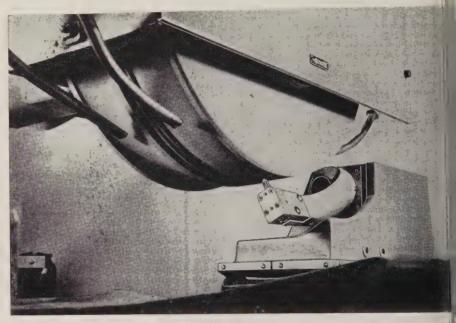
• Easily Formed—Blocks of fibrous potassium titanate, which can be formed into any desired shape while wet, show exceptional dimensional stability upon prolonged exposure to heating. After six days' aging at 1900° F, blocks have shown no di-

mensional change.

The material has almost four times the insulating value of commercial firebricks at comparable temperatures with one-twelfth the

weight of firebricks, says Dr. Suttor

One of the unusual advantage is ease of fabrication. Available forms include loose fibers, loose fiblocks of varying densities, mats various thicknesses, and "lumps Also available is a trowelable material which, when combined with water, can be spread onto almost any irregular surface like mortar.



Contour wheel dresser with single diamond is accurate

Tool Dresses Two Wheels

A recently developed dressing technique uses a singlediamond tool to handle complex contours on double grinding wheels. Two-diamond method is conventional approach

ONLY ONE diamond is needed to dress a double grinding wheel used to contour grind airfoil lugs on jet engine blades, two at a time, to 0.0002 in. at Thompson Products Inc.'s jet division, Cleveland.

Seven blade sizes are produced for the Pratt & Whitney J-75 engine.

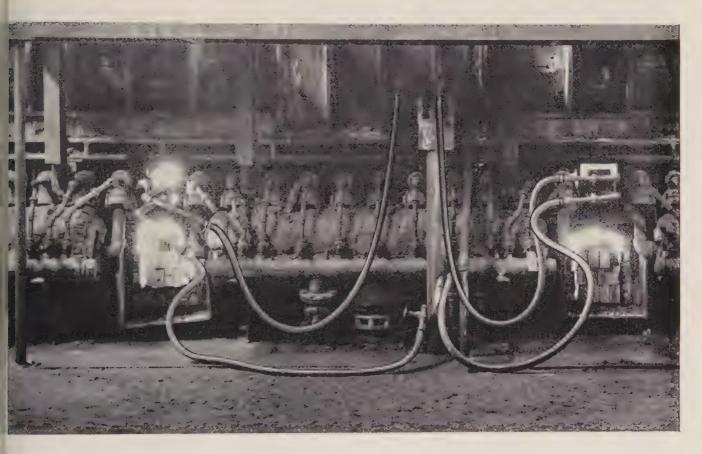
The single-diamond technique is said to be the latest in wheel dressing of complex contours and double wheels. The unit was developed by Hoglund Engineering & Mfg. Co. Berkeley Heights, N. I.

Berkeley Heights, N. J.

Installed on a Thompson Model
C surface grinder, the dresser moves
into action after about 50 grindings.
The key to its accuracy is cam
control of the diamond. As it traverses the wheel face, the diamond is
pivoted about its own point so that
it is always at the proper angle to
the face.



BIG STEEL MILL DEPENDS on U.S. PEERLESS WATER HOSE to prevent pipe skid burn



In the Fretz-Moon furnace of this Kaiser Steel Mill in Fontana, Calif., one length of U.S. Peerless® Water Hose ("the hose with the good brown cover") carries cold water to the pipe skids, another length carries the return hot water—up to 200° F. If the hose should fail or kink, the pipe skids would burn up and costly repairs and downtime would follow.

Kaiser Steel depends on Peerless to safeguard valuable

skids and keep its pipe mill in operation. U. S. Peerless is part of the complete line of U. S. Rubber's industrial hose, engineered for use and abuse.

When you think of rubber, think of your "U. S." Distributor. He's your best source of on-the-spot technical aid, quick delivery and quality industrial rubber products.



Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y.

In Canada: Dominion Rubber Company, Ltd.

PROGRESS IN STEELMAKING



Television receiver (top right) in the pulpit of the roughing mill allows operator to make an instant check on progress at the reversing mill

TV Links Rolling Mills

It enables roughing mill operator to ready billets for the finishing mill at the right moment. A 15-second delay could cool the steel enough to make it hard to work

HOW do you keep tabs on two operations that must be co-ordinated, but are more than 700 ft apart?

Dominion Foundries & Steel Ltd., Hamilton, Ont., has done it by adding closed-circuit television to a communications system that includes telephone intercom, whistles, and signal lights. The TV circuit helps co-ordinate the roughing and rolling mills on the tin plate line.

• The Operations—The two-high roughing mill takes billets at 2300° F and passes them back and forth

through the rolls about 20 times, reducing them to a 1-in. thickness.

The strip is then passed to the four-high, 60-in. reversing mill that completes the operation, rolling down to the size required for tin plate and pipe production.

• How TV Helps—By checking the TV screen in his pulpit, the chief operator of the roughing mill can read a gage at the reversing mill, enabling him to adjust table and roller speed so the billet will be ready for the reversing mill at the right moment. A 15-second deleter on the roughing mill can reduct the temperature of the steel enough to make it difficult to roll during the final stage.

A second television monitor at camera control unit, in a small fice near the second mill, are us for testing and alignment purpost and as standby equipment.

General Precision Laborate Inc., Pleasantville, N. Y., built t equipment.

New Scale Cars Are Safe

More efficient handling of and greater safety to personnel as equipment are promised by two no 320 cu ft scale cars being built the New Castle, Pa., plant Pennsylvania Engineering Con The cars have seven different typof safety devices.

Motorized with trolley powpickup, each discharges its loconly when the car bin is direct over the receiving hopper. (Typhotoelectric cells, one on the cand one at the hopper, must liup before a valve in the cylindaline can be opened.)

Various components (such lights, air compressor, and dynam tor) are on separate padlocks safety switches to provide maximus safety. All electrical equipment weatherproofed to insure long limit

An air horn and bell serve warning signals. The bell ring continuously while the car is motion; the horn is controlled massually. A red gyrolite on each extra of the car glows when the car moving.

Another safety feature, a valve the air brake line, prevents moving the car electrically unless pressure is sufficient to operate the brake properly.

The cars have automatic printin and recording scales, as well as viual dials. The scales give accuration control and positive record of the material charged to the blast funace, helping the operator to produce iron at the optimum rate.

The cars will meet close clean ance tolerances of existing bins and hoppers. The bin gates are of the undercutting type to provide minimum height of the bin above the rails.

GRINDING PRODUCTION INCREASED 50% WITH "WETORDRY" BELTS

MANUFACTURER: Dictaphone Corporation

ADDRESS: Bridgeport, Conn.

PRODUCTS MANUFACTURED: Dictating Equipment

3M ABRASIVE USED:
"WETORDRY" Tri-M-ite Cloth Belts

HOW 3M ABRASIVES ARE USED: Sizing bottom side of cast magnesium main frame of Dictaphone dictating machine, to remove burrs and casting imperfections for true flatness.

OPERATIONAL DATA ON 3M METHOD: Grit 60 "Wetordry

Tri-M-ite" Cloth Belt is used on an Engleberg Huller BG8 Grinder. Constant flow of water is maintained over grind surface of the magnesium.

OPERATIONAL DATA ON PREVIOUS METHOD: A competitive brand of abrasive belt was used for the same operation.

PROVEN ADVANTAGES OF 3M METHOD: Production increased 50% per belt—from 900 pieces with the former belt to 1,350 pieces per 3M Belt with no loss in time or decrease in quality.

OTHER 3M ABRASIVE PRODUCTS NOW IN USE: "Three-M-ite Resinite" Cloth Belts are used to finish aluminum trim bands; "Tri-M-ite" Cloth "PG" Wheel used to prepolish dictating belt mandrel ends.

WANT MORE INFORMATION? Send for free manual, "3M Method of Belt Grinding and Finishing." Just write on your letterhead to 3M Co., St. Paul 6, Minn., Dept. GJ-128.

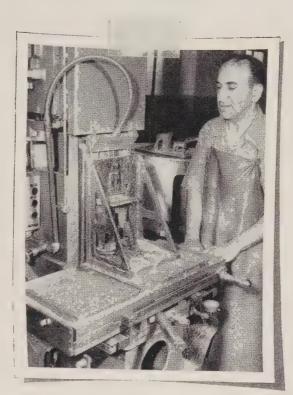
"Wetordry", "Tri-M-ite", "Resinite", and "Three-M-ite" are registered trademarks of 3M Co., St. Paul 6, Minn, Export: 99 Park Ave., New York. Canada: London, Ontario

3M Coated Abrasives

"WETORDRY" CLOTH BELTS

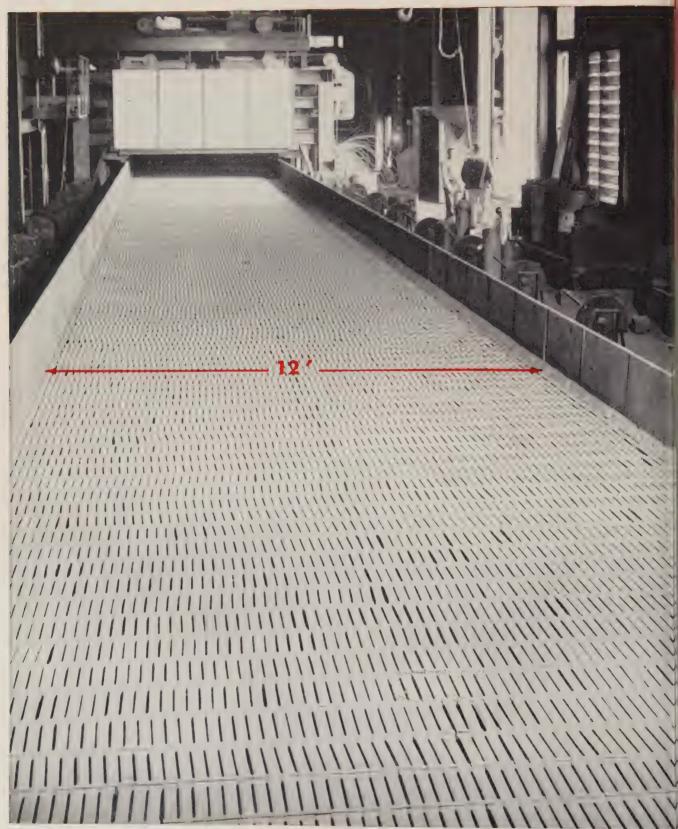
MINNESOTA MINING AND MANUFACTURING COMPANY
... WHERE RESEARCH IS THE KEY TO TOMORROW





FOR NATIONAL STEEL

KOPPERS BUILDS WORLD'S



Weirton Steel's sintering machine is one of the world's two operating 12-foot wide machines for sintering iron ore. This machine was design to produce a minimum of 5,500 tons of sinter product per day.

SINTERING MACHINES

two largest iron ore sintering machines in the world h 12 feet wide—are now in operation. Both are part plants built by Koppers. Both are helping Divisions National Steel Corporation improve productivity.

The machine shown here is operating at Weirton Steel mpany. It is 12 feet wide, 147 feet long over the d boxes, has a total grate area of 1,764 sq. ft. It was igned to produce 5,500 tons of sinter product per day.

An even larger machine is also in production at Great kes Steel, another Division of National Steel Corpoion. This new giant is 12 feet wide and 199 feet 6 hes long over the wind boxes. It was designed to proce 7,200 tons of sinter product per day.

These two pioneering machines are typical of the ntinual modernization program being carried on oughout the National Steel organization. A forward-king approach on the part of National Steel's operation and management personnel, and their complete operation and assistance during every phase of engiring and construction, contributed greatly to the occasional completion of these two projects by Koppers.

Comprehensive Koppers service to the steel industry cludes design, engineering, procurement, construction d initial operation of almost any type of equipment.

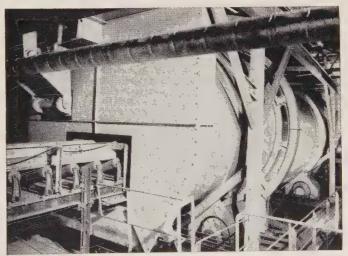
If you need help or advice on any expansion or modnization project, call on Koppers—the world's largest, set experienced, best qualified steel-plant construction m. Our engineers and management personnel can be ached at Koppers Company, Inc., Engineering and onstruction Division, Pittsburgh 19, Pennsylvania.



CONSTRUCTION SERVICE



The straight-line, forced-draft sinter cooler of Weirton Steel's new sintering plant is 10 feet wide, 147 feet long.

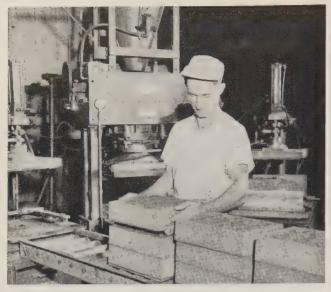


This 12' x 40' balling drum, in use at the Weirton plant, is designed to prepare the raw mix material fed to the sinter machine.



KOPPERS

December 15, 1958



Hardened molds are placed on conveyor that will take them to the gassing area



Some of the castings produced by the Azcast technique of Swayne, Robinson & Co.

CO₂ Technique Upgrades Castings

Principal advantages are tighter dimensional tolerances, greater fidelity of detail, and smooth surfaces. Buyers report considerable reduction in machining costs

THE AZCAST CO₂ molding process provides high quality castings while saving dollars in production, reports Swayne, Robinson & Co., Richmond, Ind., a foundry specializing in gray iron and aluminum castings.

C. K. Robinson Jr., vice president, describes the process as a practical step between the high cost of quality and the low cost of fast production.

• Principal Advantages—The technique produces parts with above average dimensional advantages. Tolerances have been held to plus or

minus 0.015 in. with extremely smooth surfaces.

Fidelity of detail characterizes the castings which have included such parts as impellers, pinions, gears, rings, and housings cast in both aluminum and gray iron.

The CO₂ process also eliminates mold flasks, slip jackets, bottom boards, and weights, and does away with driers and coreplates in making cores. Those advantages more than offset the additional cost of gassing the molds and cores.

• Pattern Equipment — Since the final accuracy and finish of the

castings depends on the impression made by the pattern on the molds careful attention must be given to pattern preparation.

A basic aluminum box contains the pattern equipment. Two boxes are required for a cope and drag of for high production of one pattern

The pattern plate should be aluminum, but the patterns themselves should be brass to withstand wear of the blown sand, explains Mr. Robinson. Vertical surfaces may not require draft, nor is there need to make expansion allowances on the pattern.

• Sand Mix Is Key — The proper mix of sand, binder, and release agent is necessary to produce a mold that will develop sufficient heat resistance and reduce gas development. In the CO₂ process, sodium silicate is mixed with the sandipassing CO₂ through the mix hardlers the sodium silicate to produce a hard, smooth surface.

The sand mix is blown under high pressure into the pattern box. A squeeze plate is rolled between the blow plate and the mold box. The mold is squeezed, removed from the molding machine, and placed under the gassing machine where the mold is hardened. The molds are automatically raised from the box by stripping pins and them placed on a conveyor to be poured.

In some cases, stack molding has been used successfully with savings in metal yield and molding cost.

\$70 COST CUT for each electrode assembly—through use of Anaconda extruded copper shapes—helped Frank C. Cheston Co. add replaceable contact feature in its line of electric rivet heaters.

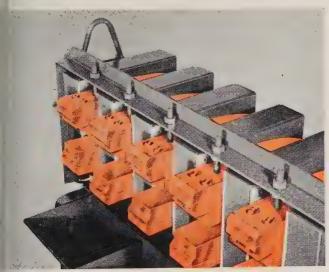


Electric rivet heaters are tough, simple machines that have for years been saving time and money in riveting operations. But Frank C. Cheston Co., Newark, N. J., saw a chance to save its customers some money in maintenance, too, by making electrode-assembly contacts easy to remove for resurfacing or replacement.

Originally these contacts were integral with the laminated copper conductor forming a one-turn secondary in the step-down transformer. In redesign, only parent blocks (1, at left) are welded to the conductor. Contact shoes (2 and 3), which mate precisely with parent blocks for unimpaired conductivity, are easily removed by unbolting*.

tivity, are easily removed by unbolting*.

Machining pieces 1, 2, and 3 from copper bar stock ran costs so high that the price of the heater would have become unrealistic. American Brass specialists were consulted and precisely shaped extrusions of high-conductivity copper were produced, from which the finished sections are cut. Tolerances were closer and surfaces finer than with machining—and costs per electrode assembly were cut \$70.



lose-up of a 5-electrode Cheston electric rivet heater with the new movable contact feature for easier maintenance. Savings from use f Anaconda extrusions enabled Cheston to include this new feater at practically the same price as heaters of previous design.

a fresh look at the way you're making metal parts. Aake a note of any part you suspect might benefit by the use of extrusions, special-shaped tube, die-pressed forgings, etc. Then call in your American Brass Company epresentative and talk it over with him. He will see hat your problem gets to the right Anaconda technical pecialists promptly and will expedite the answer. Or write: The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda Brass, Ltd., New Toronto, Ontario.



Cheston electric rivet heater in use showing how step-design of upper contact (2, in illustration above, left) makes it easy to heat both long and short rivets. Contacts are opened by foot pedal and contact pressure is maintained by springs seen just above the pedal.

*Bolts are of Everdur®, Anaconda copper-silicon alloy.

DIE-PRESSED FORGINGS · SPECIAL-SHAPED TUBES
EXTRUSIONS · FABRICATED METAL PARTS

ANACONDA®

Made by The American Brass Company

141



Photo courtesy of American Bridge Division of the United States Steel Corporation

BAKER'S MAGDOLITE AND JEBCOLITE are always 5 ways better

Continued research and development throughout the years, plus The J. E. Baker Company's precisely controlled manufacturing methods, have resulted in the superior, properly burned, grain-sized Magdolite and Jebcolite particles which help provide:

More uniform ingots—increased ingot production—increased furnace efficiency—lower

refractory costs—less defective production material.

Magdolite and Jebcolite* are the original dead-burned dolomites that offer better composition, preparation, strength, economy and quality. Don't say "dolomite." Save dollars. Specify Baker's Magdolite for open hearth and Jebcolite for electric furnace use.

*Jebcolite has the same superior chemical, physical and mineralogical characteristics as Magdolite and differs only in grain size which is designed specifically for electric furnace application.

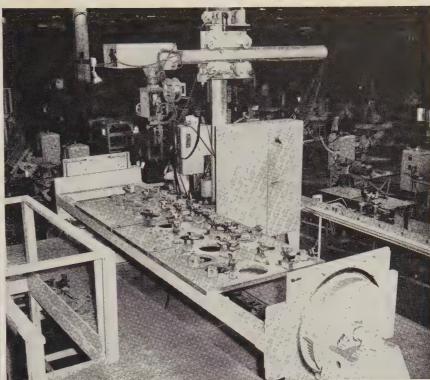


THE J. E. BAKER COMPANY

YORK, PENNSYLVANIA

PLANTS: BILLMEYER, YORK, PENNSYLVANIA - MILLERSVILLE, OHIO





Suspension arms Cadillac makes for its light tanks are shown in fixtures, ready for welding. Cast bearings are welded to both ends of stamped bodies. Dual Shield mounted on manipulator boom (right) rotates 370 degrees to make welds

Cadillac Adopts Dual Shield

Turning from submerged arc, this tank builder finds hidden profit in flux-CO² combination. More speed, deeper penetration, and stouter welds result. It's easily automated

SEMIAUTOMATIC welders are getting a big play for use with automatic equipment.

The reasons: Higher speeds, deeper penetration, improved physicals, and easier cleanup, compared with older methods.

That's the experience of Cadillac Div., General Motors Corp., which makes tanks and weapon carriers at its Cleveland Ordnance Plant.

Almost all of its high strength welded parts are made of 4130 steel. The firm has turned heavily to Dual Shield, made by National Cylinder Gas Co. Div., Chemetron Corp., Chicago. It features an alloyed flux-cored wire and carbon dioxide (CO₂) shielding gas. Welds were

formerly made with CO₂ shielding and solid wire which produced unsatisfactory welds.

• Example—Cadillac uses a fixture which holds eight suspension arms in an automatic welding setup. The head on a (Herrick) welding manipulator lowers, rotates the head to make the weld, retracts and indexes the device for the next arm. The operator only loads preheated parts and removes welded parts to a postheating device.

Each arm is made of a $\frac{1}{4}$ -in. stamping with two cast bearing housings. (One is $\frac{1}{4}$ -in. material, the other $\frac{1}{2}$ in.) Dual Shield welds get about 50 per cent penetration

while depositing a ½-in. fillet at 25 ipm. The firm says its experience with stick electrodes showed only one-fourth to one-third as much penetration. Spatter is slight and the flux removes easily.

Joint tensile strengths of the weldments (using No. 112 wire) are usually well over 100,000 psi. Joint fit doesn't need to be as close as with the older methods and fillet appearance is uniform. Capacity of the setup is far beyond Cadillac's present daily requirements.

Dual Shield units are versatile: Other types of electrodes requiring gas shielding can be used. The wire can be applied to other equipment in kit form. The main changes are the gas cup, wire, and shielding gas. Dual Shield equipment also takes regular solid wire when necessary. Water cooling provisions, when needed, are self-contained.



STEEL PRODUCTS...

used from the ground u

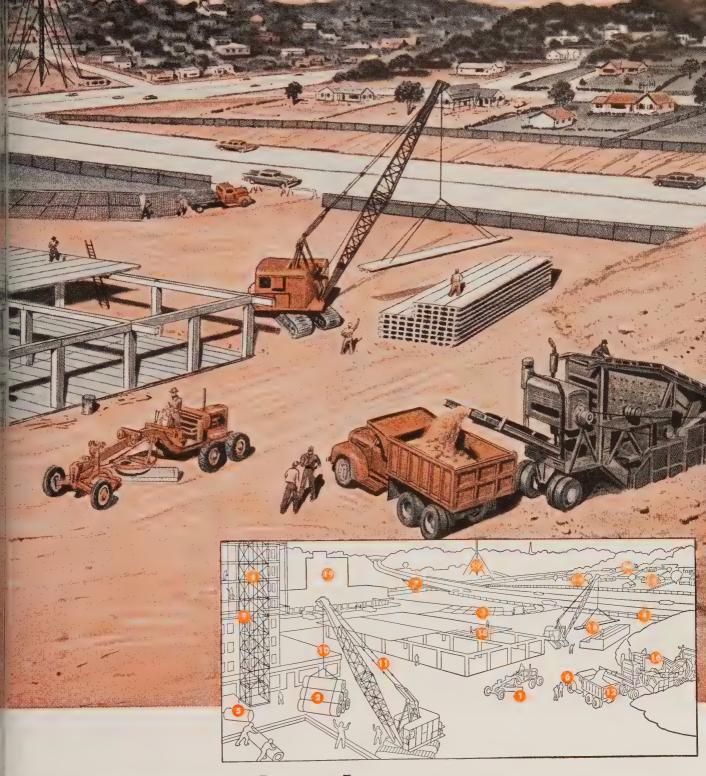
A seemingly endless variety of equipment and materials flow into the construction site for a modern suburban development project. Many of these are made of steel—from structural members to fabricated components... from materials handling to construction equipment. The logistics problem is a

complicated one for all the contractors involved.

That's why many contractors... and other big steel users... are turning to CF&I as a single source for many of their steel requirements. CF&I manufactures a complete range of steel products—those shown here and many more. And

steel buyers know they can coup on quick delivery when they ord from this completely integrate producer...know they can coup on the top quality that has looken a CF&I trademark.

If you use steel in any form will pay you to contact the CF Sales Representative nearest you



n suburban development

Fal Cutting Edges linton Welded Wire Building Fabric

Hinton Welded Wire Road Fabric Reglock Chain Link Fence

Claymont Flanged and Dished Heads

Vickwire Springs and Formed Wires

Claymont All-Welded Steel Girders **Nickwire Elevator Cable**

- CF&I Hardware Cloth
- Wickwire Wire Rope and Slings
- Wickwire Boom Pendants
- (B) Claymont Alloy Steel Plates
- B Gold Strand Insect Wire Screening
- CF&I-Wissco TV Guy Wire
- (B) Perfection Door Springs and Quick **Hitch Gate Springs**
- **©** CF&I Space Screens
- (I) CF&I Galvanized Steel Strand
- (B) CF&I Prestressed Concrete Strand
- (Fal Reinforcing Bars (in concrete)

THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque * Amarillo * Billings * Boise * Butte * Denver * El Paso Ft. Worth * Houston * Kansas City * Lincoln (Neb.) * Los Angeles * Oakland * Oklahoma City * Phoenix * Portland * Pueblo Salt Lake City * San Antonio * San Francisco * San Leandro * Seattle * Spokane * Wichita WICKWIRE SPENCER STEEL DISIVION—Atlanta * Boston * Buffalo * Chicago * Detroit * New Orleans * New York * Philadelphia CF&I OFFICES IN CANADA: Montreal * Toronto



Everdur silicon-bronze slab is cast semicontinuously at American Brass Co.

Casting Method Upgrades Copper Billets and Slabs

It produces castings with uniform, fine-grained structures and without entrapped oxides, dross, and gases. Long castings and small cropping losses improve yield

SEMICONTINUOUS casting of copper and brass extrusion billets and rolling mill slabs at the Ansonia (Conn.) Div. of American Brass Co. promises improved metallurgical quality to users and fabricators of the red metal.

Steady casting conditions give uniform, dense ingot structure. Smooth metal pouring eliminates turbulence and entrapped oxides, dross, and gases. Rapid cooling produces a fine-grained, sound structure even in large cross sections.

• Benefits to Casters - Semicon-

tinuous casting brings cost savings to casters through mechanized operation and larger ingot sizes that improve plant productivity.

The predominantly longitudinal solidification of the metal prevents piping and internal stresses. Longer casting lengths and small cropping losses improve yield.

• Cast Many Alloys—In addition to the common copper-base alloys, such as gilding metal, commercial bronze, red brass, low brass, cartridge brass, and yellow brass, American Brass Co. has semicontinuously cast leaded brasses, aluminum bronzes, and copper-silicon alloys.

The new casting installation comprises a series of machines built by Lobeck Casting Processes Inc., New York, each fed with metall from Ajax electric induction furnaces.

The machines produce multiplestrand extrusion billets up to 8 in. in diameter and rolling mill slabs to 6 x 24½ in., up to 12 ft long. Each station has its own hydraulic power unit which controls the speed of casting and the length of stroke.

• Metal Cooled Rapidly—In casting, the metal flows from the furnace spout along a launder to a distributor which insures splashfree entry of metal into the molds.

The metal is cooled in passing through the water-jacketed, bottomless molds and is solid by the time it leaves them. The molds are continuously filled with metal to match the withdrawal of the solidified castings until the ingots have been cast to required length.

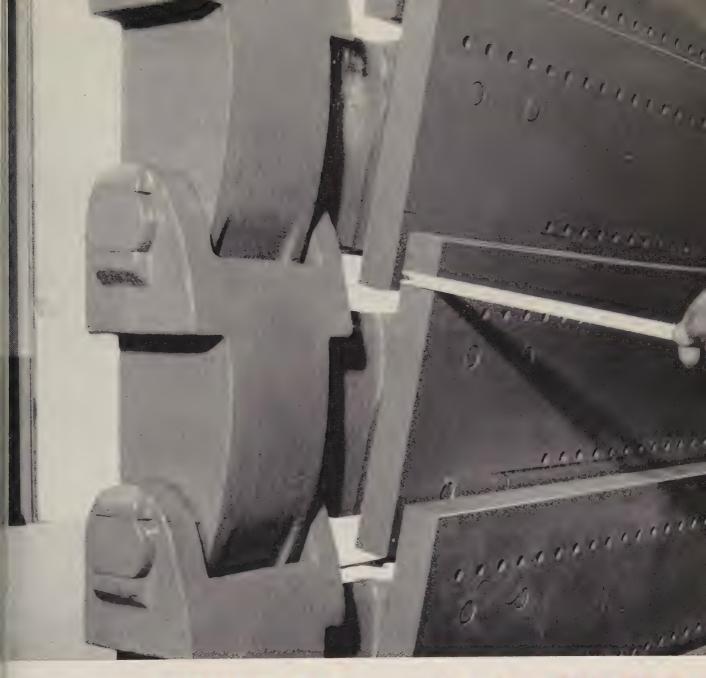
Rubber Stands Acids, Wear

Plating cylinders of a new, hightemperature hard rubber have withstood three years of handling hot corrosives and severe mechanical abrasion at Howard Plating Industries Inc., Detroit.

The tank material is Ace Tempron, a product of American Hard Rubber Co., a division of Amerace Corp., New York. The cylinders are part of a 26-station Udylite automatic barrel plater installed three years ago.

Tempron has good chemical resistance, high tensile strength, and a high distortion temperature (275° F). Those properties make it a good structural material for equipment and machine parts subject to chemical attack.

The duty at Howard is tough. Besides the hot corrosives, they must stand up to severe mechanical wear from tumbling of metal parts as they revolve during every step of the plating cycle. Because the average load is about 100 lb, cylinders in use three years have carried at least 2.5 million lb of work.



BUILT BIG ... TO CLEAN BIG

Giant Pangborn unit Rotoblasts loads up to 12,000 lbs. in minutes!

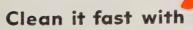
A side view of the 72 cu. ft. Pangborn Rotoblast Barrel. Pangborn Barrels available in 1½, 3, 6, 12, 18, 20, 32, 72 and 102 cubic foot sizes

How do you build a giant blast cleaning barrel? If you're Pangborn, you use steel, inches thick. You put in the heaviest apron conveyor ever made. You incorporate the patented abrasive separator, abrasive-tight door, simplified Pangborn construction. You power it with two Rotoblast wheels that hurl 60 tons of abrasive an hour.

Sure, it's tough to build... but it's worth it when you come up with a 72 cu. ft. Pangborn Rotoblast® Barrel! This unit cleans 6-ton loads in five minutes and gives the lowest operating

and maintenance costs in the blast cleaning field! It's one of many Pangborn Rotoblast Machines. There's one for *your* problem.

The Pangborn Engineer in your area will be glad to take off his coat and go to work on your cleaning problem at no obligation. And for complete information on Rotoblast Barrels, write to: Pangborn Corp., 1600 Pangborn Blvd., Hagerstown, Md. Manufacturers of Blast Cleaning & Dust Control Equipment.



Panaborn ROTOBLAST®

Steel Mill eliminates Two Handlings

... Savings in 1½ months = total cost of SELAS
heat processing equipment

Conventional practice of reheating blooms had been to remove them from the rolling process, charge them into batch-type reheating furnaces, soak them for 60 to 90 minutes. Blooms were then taken from the furnace, placed back onto the rolling mill table for final rolling.

At least 2 handlings of steel by mechanical manipulator were involved. It is generally agreed that picking up hot steel, transporting it 100-150 feet and setting it

down, cost \$2 per ton.

The following 15 economic factors prove that this steel mill's investment in Selas continuous heat processing equipment yielded immediate returns in reduced costs and improved product quality:

Material Handling

Selas continuous heat processing has eliminated both handlings . . . saved enough to pay for the heat processing equipment in $1\frac{1}{2}$ months!

Product Value

The value of the material passing through this furnace line in only 26 hours equals the cost of the entire heat processing installation!

Material Saving

Because reheating time is 3 minutes instead of the conventional 60 to 90 minutes at 2250°F, less scale is formed. This amounts to a saving of 3 tons of steel per hour—enough to pay for the continuous furnace line in only 5½ months!

Fuel Efficiency

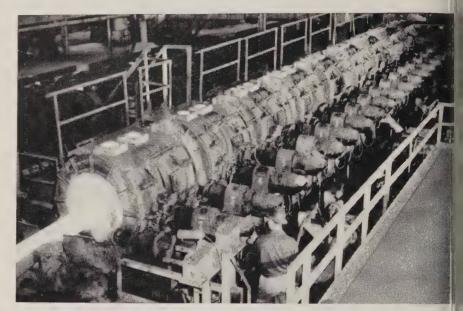
Fuel efficiency is not of major consequence because the total fuel cost is less than 0.6% of product value. Fuel efficiency could be increased through recuperation, Even if fuel efficiency could be increased by 50%, however, the cost of this additional equipment—plus higher maintenance—would add more to production cost than the 0.3% saved.

Automatic Operation

The furnace line accepts blooms at the charge-end whenever space is available in the furnace. Or, if no bloom is on the conveyor the furnaces automatically go on low temperature setting. Blooms, at optimum rolling temperature, are automatically delivered whenever required by the rail mill.

Temperature Control

Fast response of the Gradiation® furnaces permits accurate automatic control of bloom temperature. Uniform heating by radiant gas-fired Duradiant® burners produces optimum rolling temperature throughout every bloom.



Continuous Selas furnace line, located between a blooming mill and a rail mill, reheats blooms "on the fly," at rates up to 198 tons per hour.

Labor Requirements

None! Routine supervisory inspection of recording equipment is the total human contribution required.

Work in Process

Only 9½ tons of steel (maximum) need be in process to meet even the most widely varying production requirements. The previous method required 195 tons.

Product Quality

Reproducible metallurgical uniformity is achieved within each bloom and from bloom to bloom.

Equipment Flexibility

Furnace line heats blooms from 8 inches square to 11 inches square in cross-section, 8 to 22 feet long, weighing from 1744 to 9050 pounds each,

Maintenance

Simple, minimum. A stand-by barrel is quickly inserted into the line whenever major overhaul is necessary.

In 23 months of continuous operation, seven barrel furnaces have been re-lined, at a cost of only $\frac{2}{3}$ cents per ton of reheated blooms. This is less than 0.007% of the value of product passing through

the furnace line, and amounts to but 1.03% of the total original equipment cost,

Production Requirements

The furnace line can handle up to 198 tons per hour according to fluctuating de mands of the rail mill.

Process Coordination

This continuous Selas line is an integral part of the roll conveyor between the blooming mill and the rail mill.

Floor Space

Valuable floor space was saved through Selas fast heating. This entire furnace line occupies only 63 x 11 feet.

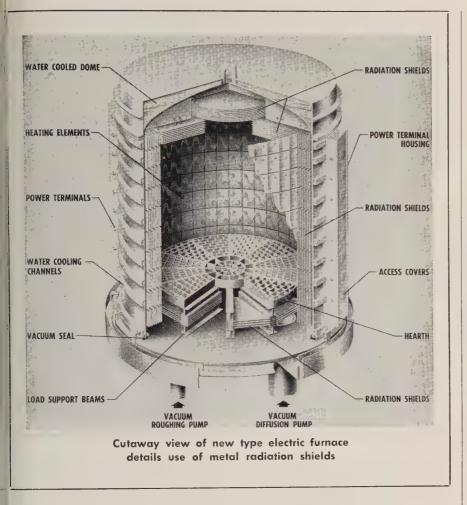
Human Element

Automatic control and operation completely eliminate variables in product quality due to the human element.

For case histories covering other steel mill heat processing operations, as well as heat treating, heating for hot working and brazing, send for reprint "An Economic Appraisal of Continuous Heat Processing." Address Dept. 212, Selas Corporation of America, Dresher, Pa.

Gradiation and Duradiant are registered trade names of Selas Corporation of America.





Metal Insulates Furnace

Since it uses no insulating bricks, a high vacuum can be quickly reached and easily maintained. Rapid heating and cooling cycles are characteristic of the unit

RADIATION shields of heat resisting alloy (in place of bricks) are used in an electric bell-type furnace developed by General Electric Co., Schenectady, N. Y.

The shields are arranged in layers of cylindrical shells on the inside walls of the heating chamber. Layers of the alloy sheets are also used in the top and bottom so that the material being treated is completely enclosed.

High vacuum, temperatures to 2700° F, and fast response in heat

treat and brazing are obtained. The furnace is used mainly for heat treating superalloys of stainless steel and refractory metals such as titanium and zirconium.

The furnace casing has a water jacket to keep it cool enough to retain the strength needed to withstand atmospheric pressure while the workload is at high temperatures.

Losses due to convection are reduced by the vacuum. Protective gas atmosphere can be used.

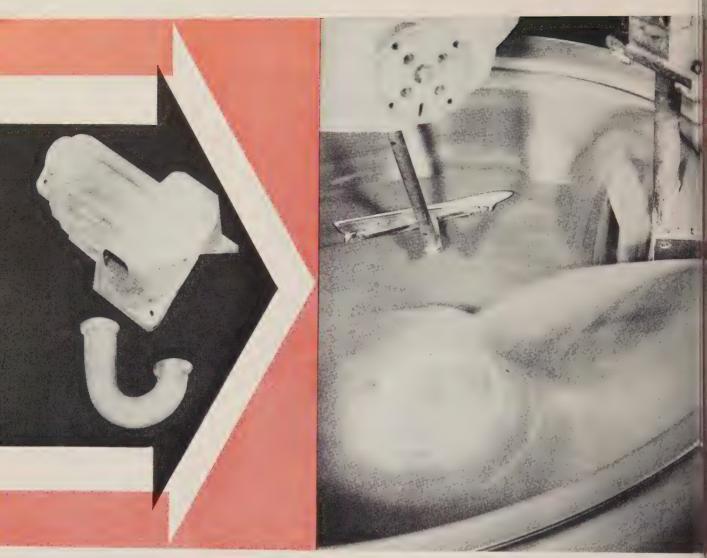
How do
you
measure
the <u>real</u>
cost of
your heat
processing?

A continuous furnace is more than just a brick-lined structure built to heat a material; it is a processing tool.

Like all processing tools, it must be evaluated on an overall basis. Fuel consumption and efficiency may be completely outweighed by many more-important economic factors encompassing your work-piece, your total production program, and your work force.

Your evaluation may well prove that an investment now in Selas continuous heat processing will bring immediate returns in reduced costs and improved product quality. (See case history on facing page describing continuous bloom reheating).





Parts move through swirling loose abrasive to provide . . .

Quick Finishing at Low Cost

COMPLEX shapes can be finished quickly, at low cost, in one step with loose abrasives. Popularity of the process for many small decorative parts is growing.

Reason: Today's high quality diecastings do not require prefinishing like castings of several years ago. (Surface defects are emphasized by loose abrasives unless they are first removed by spot finishing.)

Assuming quality of the casting is satisfactory, three factors determine

if a part is suited to the process:

- Size—part cannot be large.
- Shape—should induce good abrasive flow.
- Strength—to withstand the forces of cleaning media.
- Fixtures Are Important—To realize the economy of the process, you must design positive holding fixtures that can be easily loaded and unloaded. They have to withstand the loads of abrasive flow and im-

pact blows if parts break away. In some cases, it is important for the fixtures to back up the part to prevent distortion.

• Finishing Methods—Once a part qualifies from a design standpoint, the best process and type of machine must be selected. Three basic techniques are used: 1. Rotating an abrasive stream over and about the parts. 2. Revolving or pushing parts through a static mass of abrasive.



Advances have been made in process for polishing small parts. Here's a roundup on atest in equipment. Machines described can handle a varity of applications

Scrubbing parts with an abrasive

lurry.

Materials used range from conentional barrel finish media, such s chips and steel balls for deburing, to special corn cob mixtures or polishing. Loose abrasives are used in the form of slurries, fluid hip masses, and moist or dry granuar mixtures.

A variety of machines operate on hese principles:

Mechamatic — Mass production

deburring and precision finishing is done by a machine built by Mecha-Finish Corp., Sturgis, Mich. part is fixtured at the base of a spindle. Abrasive moves against the submerged part. The unit automatically rises and is water flushed before unloading the part.

Spindles rotate at about 8 rpm. They move with or against the flow in a revolving annular tub. Process time is controlled by the speed of the spindles and the tub.

• Roto-Matic — Operating on a similar principle is a machine made by Roto-Finish Corp., Kalamazoo, Mich. It is frequently used to finish aircraft turbine blades and buckets.

A series of 16 vertical spindles moves clockwise through the abrasive chips, water, and cleaning compound carried in the opposite direc-

- Gyroburr—A small finishing machine has been developed by Hyatt Div. of General Motors Corp. to deburr and finish bearing cages for low volume production or batch operation. The tub holding the abrasive is stationary. Parts (rotated at 75 rpm) are positioned at an angle to make them wobble. Process time usually ranges from 6 to 10 minutes.
- Roto-Ram—With this unit, parts are pushed and pulled through a static mass of abrasive. This technique is particularly suited to deburring and finishing long, slender parts like aircraft spars. Roto-Ram is also made by Roto-Finish Corp.
- Burr-O-Matic—A feature of this finisher is an oscillating head that pivots upward and back to facilitate loading and unloading parts. Two or more machines are coupled to finish long parts (up to $10\frac{1}{2}$ ft). The unit is made by Speed-D-Burr Corp., Glendale, Calif.
- Ger-O-Matic Universal Die Casting Div. of Hoover Ball Bearing Co., Saline, Mich., makes Ger-O-Matic for polishing parts before they are electroplated.

Normally, eight to ten rubber mats covered with fingers are submerged in an abrasive slurry to scrub part surfaces. Round fingers are used for recesses or ball-nose corners, square for flat surfaces.

• Spin-Finish — Parts are finished prior to plating in a machine developed by Grav-i-Flow Corp., Sturgis, Mich. The abrasive is granular and dry.

Parts are held in racks fastened to four spindles by a detachable coupling. Parts rotate clockwise while a main spindle moves counterclockwise half of the time, then the directions are automatically reversed.

Maximum part size is 6 to 9 in. Average time for the process (which lends itself to batch type production) is 6 to 9 minutes.

• Gyrofinishing — This method is used to finish metal surfaces before they are electroplated. F. T. Hall of GM's Technical Center reports the method originated from a fundamental study of barrel finishing and is based on the principle of reducing cycle time by increasing the relative movement between the abrasive and parts. Diecast parts are submerged in a revolving mass of free abrasive. Finishing is done in a few seconds.

Two types of gyrofinishers have been developed—vertical and horizontal. A typical vertical unit has three stations. While one head is unloaded and reloaded the others are in counterrotating drums. The superstructure is raised, indexed, and lowered, transferring the parts from station to station. Index time is about 15 seconds; cycle time, about 60 seconds.

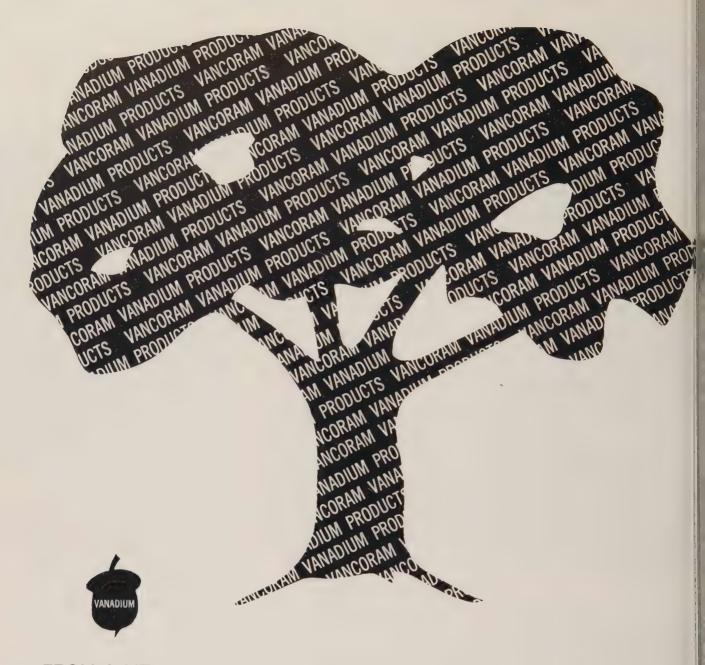
Horizontal gyrofinishers eliminate the index time.

Parts are loaded on a conveyortype fixture which moves through the rotating drum.

• Operation Techniques — To assure trouble-free operation of any of these units, it is important to have good preventive maintenance. Once a machine cycle is set for a particular application, a uniform finish will result if the abrasive is changed periodically and the quality of the preceding operations is maintained.

Loose abrasive finishing is a clean operation. Little or no ventilation is required. It is used to treat bronze, aluminum, cast iron, stainless steel, magnesium, titanium, and other metals.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, Steel, Penton Bldg., Cleveland 13, Ohio.



FROM A LITTLE VANADIUM...BIG RESULTS! How true. Just a "pinch" of vanadium produces big results in low alloy steels, large forgings, deep drawing steels. In high-speed and other tool and die steels it is indispensable. Keep in mind vanadium is one of the most effective addition agents you can buy. No other single alloying element can do so many jobs so well. What's more, you'll find that vanadium is plentiful and economical.

Vanadium also has wide uses in aluminum-base and titanium-base alloys, as well as glass, ceramics, inks, coloring agents, and in catalysts for synthetic textiles and petroleum refining. And now—High Purity Vanadium Metal is commercially available in many forms for research and the development of new products for the world of tomorrow. So you're missing an important bet if you don't find out for yourself about Vancoram Vanadium Products. Your VCA representative is ready to help you. Call him or write for information.



VANADIUM CORPORATION OF AMERICA

420 Lexington Ave., New York 17, N. Y.
Chicago • Cleveland • Detroit • Pittsburgh
Producers of alloys, metals and chemicals

Speed Control Permits Wide Range of Drive Settings

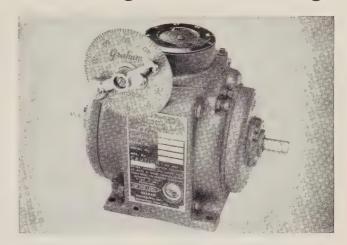
A micrometer dial that permits speed setting to 1 part in 4000 is available as optional equipment on Graham variable speed drives.

All speeds from any desired maximum to zero, and reverse, are provided. Speed can be adjusted with the transmission running or stationary.

An improved antibacklash control linkage permits accuracies of speed holding and reset of the same order.

The unit is available without motor or with built-in motor. A variety of built-in reductions include single and two-stage in-line types and right angle work gear types with shaft horizontal or vertical, up or down.

The transmission is self-lubricated and has inherent overload protection. Write: Graham Transmissions Inc., Menomonee Falls, Wis. Phone: 3600



Straddle Carrier Provides Ease of Handling



Design of this 30,000-lb capacity straddle carrier permits more general use for carrying of bulky loads.

A four speed, full reversing transmission offers a wide range of speeds for varying travel conditions. In high, the truck travels at highway speeds. In low, the carrier can climb an 18 per cent grade fully loaded.

The carrier has power steering, four-wheel power brakes, adjustable seat, and all-weather cab.

Frame and body members permit good fore and aft visibility as well as a clear view of the load.

Each wheel is independently suspended on dual coil springs with heavy duty shock absorbers mounted between the wheel forks and the main frame. Write: Hyster Co., 1003 Myers St., Danville, Ill. Phone: 6-2400

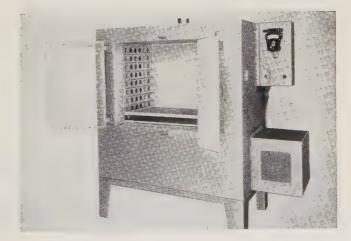
Ovens Designed for Laboratory and Production Use

Cyclo-Flow cabinet ovens are designed for precise laboratory and production operations. They come in horizontal and vertical styles.

Made in 500, 650, 850, and 1000° F series, hte ovens are equipped with standard heating chamber air velocity control from 200 to 600 fpm.

Included are an indicating temperature controller, low watt density elements, infinitely variable input controllers for matching heat input to load conditions, and adjustable exhaust vents and intake inlets.

An air flow safety switch gives positive protection in the event of motor, bearing, or fan failure. Write: L & L Mfg. Co., 305 Eighth St., Upland, Delaware County, Pa. Phone: Chester 2-5164



WHY MICROHONING*

OF GUIDE PIN BUSHINGS ASSURES FUNCTIONAL PRECISION, LONGER LIFE, LOWER COSTS

Lamina Dies and Tools, Inc., a pioneer in the development of bronzeplated guide pin bushings (bronze is electroplated on hardened steel for combined strength and smoother action), required a processing method that would economically produce bushing bores having dimensional precision, accurate geometry, functional surface characteristics, and consistent duplication to exacting specifications in every bushing.

In developing processing methods for the bushing bores, Lamina engineers found that Microhoning is best for generating final precision and functional surface characteristics at lowest cost per bushing.

Bronze, bronze-plated or steel bushings from 3/4" to 41/2" in diameter are Microhoned on this Hydrohoner. Stock removal is from .001" to .003" and average unit cycle is 30 seconds. Machine is equipped with automatic size control and tool expansion.





Characteristic cross-hatch lay pattern

Why? Because Microhoning generates a round, straight cylinder along the neutral axis of the bore; size and geometry of bushings up to $2\frac{1}{2}$ " in diameter are held to .0001" tolerances; contact area between bushing and guide pin is 25% greater than obtainable by other final processing methods. In addition, the characteristic cross-hatch lay pattern generated by Microhoning provides a "built-in" lubrication system in each bushing bore. This combined with the clean-cut surface prevents seizure or scuffing during operation of bushing. Finally, the self-dressing action of Microhoning abrasives assures continuous cutting efficiency and identical geometry, dimensions and surface finish in every bushing bore.

Thus, Lamina realizes, through Microhoning's generation of quality surfaces and precision bores, the full performance potential of bronze, bronze-plated or steel guide pin bushings—longer life, smoother action, lower costs.



Learn how Microhoning provides efficient stock removal, closer tolerances and functional surfaces—SEND FOR FREE LITERATURE.

*Registered U.S. Patent Office

MICROMATIC HONE CORP.

NEW PRODUCTS and equipment

Drill Heads Are Rugged

These universal joint type, adjustable drill heads have standard full ball bearing construction. The spindle brackets are precision machined for use with templates.

For close center distance work, they are available with spindles bracket assemblies having bronzes radial and ball thrust bearings.



Two ranges of adjustment are provided with rated capacities of ½ in. drills in cast iron or steel. Write: Thriftmaster Products Corp., 1044 A N. Plum St., Lancaster, Pa. Phone: Express 2-2101

Unit Does Precision Work

This press does precision drilling where the drill has to be held accurately in a collet.

It is shown using a Jacobs #1A



PRODUCTS and equipment

drill chuck, but it can take standard Magnus-Elect collets with a maximum runout of 0.0002 in. Special accuracy collets can be supplied.

A micrometer screw in the column can be adjusted 2 in. in thousandths. Write: F. W. Derbyshire Inc., 157 High St., Waltham 54, Mass. Phone: Twinbrook 4-2900

Drives Screws and Nuts

The Auto-Torque Driver for screws and nuts has a minimum cycle time of 8/10 second, depending on the threaded distance. It is equipped with a built-in sensing mechanism and an adjustable-torque clutch.

The clutch is accurate within 5 per cent of the torque setting. Closer tolerance is available for special applications.



The part feeder requires no auxiliary motor or vibrator. Write: Dixon Automatic Tool Inc., 2300 23rd Ave., Rockford, Ill. Phone: 5-8756

Controls Welders

The SWC-2X unit provides precise, rapid sequence, single phase control for resistance welders. It accurately sequences their functions

HOW MICROHONING*

OF GUIDE PIN BUSHINGS PROVIDES FUNCTIONAL PRECISION, LONGER LIFE, LOWER COSTS

HERE'S HOW Lamina Dies and Tools, Inc. uses Microhoning to generate final precision and functional surface characteristics in bushing bores at minimum cost.

Microhoning's low-velocity, controlled abrading technique removes a minimum of the bronze plating to obtain accuracy and functional surface characteristics. Thus, as much as possible of bronze plating is conserved and a uniform thickness of bronze throughout the bore is assured.





Above is a typical Lamina guide pin bushing. These bushings range in diameter from ¾" to 4½". An air operated, three-jaw fixture rigidly holds the work piece and is easily adapted to bushings of any size.

Because Microhoning tools have universal joints, they follow the neutral axis of the bore in generating round, straight cylinders. Since the bore location remains unchanged, concentricity between bushing I.D. and O.D. is obtained.

The combined reciprocating and rotating motions of the Microhoning tool creates on the bore surface a cross-hatch lay pattern that functions as a "built-in" lubricating system. For, the multitude of minute, diamond-shaped plateaus—over which the load is evenly distributed—are separated by a network of valleys that holds the lubricant. This better method of lubrication plus the clean-cut Microhoned surface prevent seizure or scuffing of bronze, bronze-plated and steel bushings. And, the self-dressing action of Microhoning abrasives maintains cutting efficiency to assure the same surface finish is developed in every bushing bore.



Learn how Microhoning provides efficient stock removal, closer tolerances and functional surfaces—SEND FOR FREE LITERATURE.

*Registered U.S. Patent Office

MICROMATIC HONE CORP.

CUSTOM SHEET & PLATE FABRICATION

It takes modern equipment plus craftsmanship and know-how to produce fabrications such as the giant generator housing shown here—illustrative of Kirk & Blum's ability to produce the unusual as well as the conventional types of weldments. In its 170,000 sq. ft. plant, with crane capacity to 25 tons, Kirk & Blum has complete facilities to produce, preassemble and finish a wide variety of carbon steel, stainless, aluminum, monel and other alloys assemblies up to ½" thickness. Fifty years of exceptionally varied experience is your added assurance that the job will be done quickly and economically.

Send prints for prompt quotations or write for detailed literature: The Kirk & Blum Mfg. Co., 3226 Forrer St., Cincinnati 9, Ohio.

ELECTRICAL ENCLOSURES AND HOUSINGS

CONTROL PANELS AND DESKS

BREECHINGS • STACKS • AIR AND GAS DUCTS

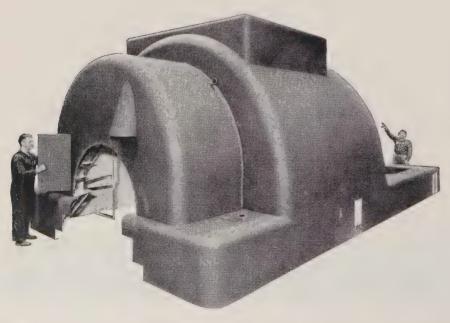
CASINGS • LOUVERS • BINS • HOPPERS • CHUTES

INSULATING JACKETING

ALUMINUM AND ALLOY FABRICATION

KIRK & BLUM

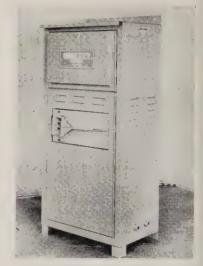
FABRICATION



PRODUCTS and equipment

whether they are stationary on portable, or equipped with single on multiple welding electrodes.

Transistors and printed circuits are used in the timing and firing



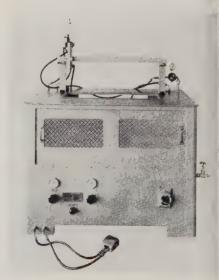
panels. The unit's electrical plugin provides rapid and simple exchange of any timing or firing panel. Write: Dept. SWC, Sciaky Bros. Inc., 4915 W. 67th St., Chicago, Ill. Phone: Portsmouth 7-5600

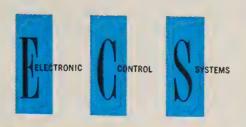
Paint Sprayed Evenly

Even deposition of paint material over an entire workpiece is assured by this automatic spray painting machine.

The unit's positive mechanical reciprocating drive permits smooth gun travel with no pauses, even when the traversing guns reverse direction.

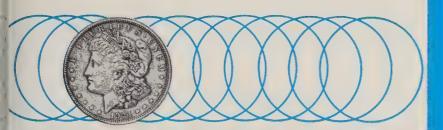
The guns paint in both directions automatically shutting off at the

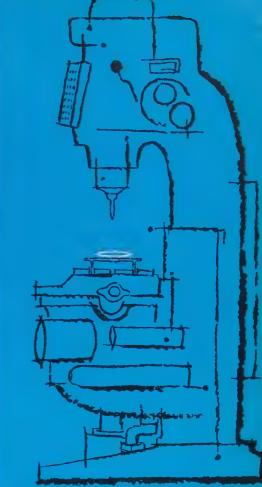




LEADERS IN NUMERICAL CONTROL







lowest cost contouring control

DIGIMATIC 191

CONTOURING CONTROL SYSTEM

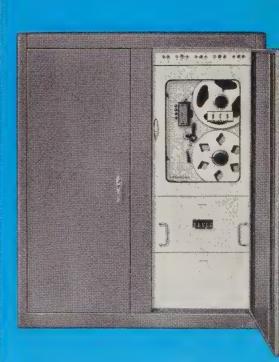
Lowest cost machine tool contouring system now on the market, both in purchase price and operating expense. Simple to program and operate. Designed for everyday use in the average machine shop to shorten lead times, reduce costs, improve quality and increase output.

Fits medium duty tools... small boring mills, knee mills, profilers, lathes. with feed rates up to 25'' per minute. Cuts true circles, curves and straight lines with ± 0.001 -inch control accuracy. Eliminates spoilage, provides exact reproductibility, and drastically reduces machining time. Write for 12-page "Digimatic 191 Systems" Catalog.

ELECTRONIC CONTROL SYSTEMS

STROMBERG-CARLSON

DIVISION OF GENERAL DYNAMICS CORPORATION 2231 S Barrington Avenue • Los Angeles 64, California



How to Sidestep Obsolescence

By upgrading plant equipment now, while demand is low, you can sidestep future obsolescence and be ready for tomorrow's production peaks. An important part of this program can be General Electric's new packaged, adjustable-speed drive—the Speed Variator.

Because of its wide speed range and precise regulation, it is ideal for modern, high-speed production. For example, in processing lines, rolling and tube mills, the Speed Variator maintains speeds automatically, accelerates and decelerates smoothly, controls tensions accurately.

New Amplistat Regulator and Static Exciter, standard on all new G-E Speed Variators, have no moving parts. As a result, maintenance costs are reduced.

To find out how the Speed Variator can help you obtain maximum drive flexibility, call your General Electric Sales Engineer, or write for GEA-6643. Direct Current Motor & Generator Department, Erie, Pa.

Progress Is Our Most Important Product



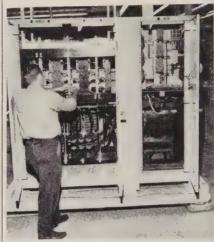




end of each stroke. Write: Conforming Matrix Corp., 345 Factories Bldg., Toledo 2, Ohio. Phone: Cherry 8-3518

Rectifier Water Cooled

A water-cooled silicon rectifier provides regulated or unregulated direct current for steel, electrochemical, plating, and other continuous processing lines.

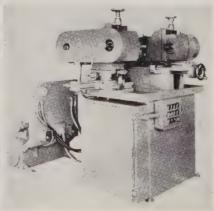


The unit uses saturable reactoramplistat control to maintain the desired current level within ± 1 per cent with unit efficiencies ranging from 90 to 95 per cent, depending on voltage rating of the equipment. Write: General Electric Co., Schenectady 5, N. Y. Phone: Franklin 4-2211

Does Production Work

Variations of this duplex Half-Mill unit can handle slotting, sawing, face milling, keyway cutting, slab milling, boring, and many other operations.

The machine has a standard Hy-



Flex hydraulic panel, two 2 hp, N 40 taper spindle, heavy duty head and a combination of standar slides.

In production cycle, the oppose spindles rapid traverse toward ear other, feed to depth, dwell, and metract. They stop automatically fit safe unloading. Write: U. S.-Burk Machine Tool Div., Cincinnati MI Corp., Brotherton Road and Pentsylvania Railroad, Cincinnati 22 Ohio. Phone: Bramble 1-5000

Lube Clings to Gears

A gear grease in pushbutton aerisol cans protects open gears, chain cams, and wire rope. Gear-Lus Spray forms a tack surface short after spraying.

Under wet or dry, dusty or clear conditions, it clings to the frictions surfaces. Much of the constant replacement required with regular lubricants is eliminated. Write Acrolite Products Inc., 106 Ashlan Ave., West Orange, N. J. Phone Orange 4-2558

Protects Electrical Units

Liquid Alconol-400 protects electrical and precision mechanical equipment against moisture, corresion, and fungus.

It is applied by dip, spray, brush over the entire electrical system, and will clean while it diposits a protective microfilm. Electrical characteristics of the system are unaffected.

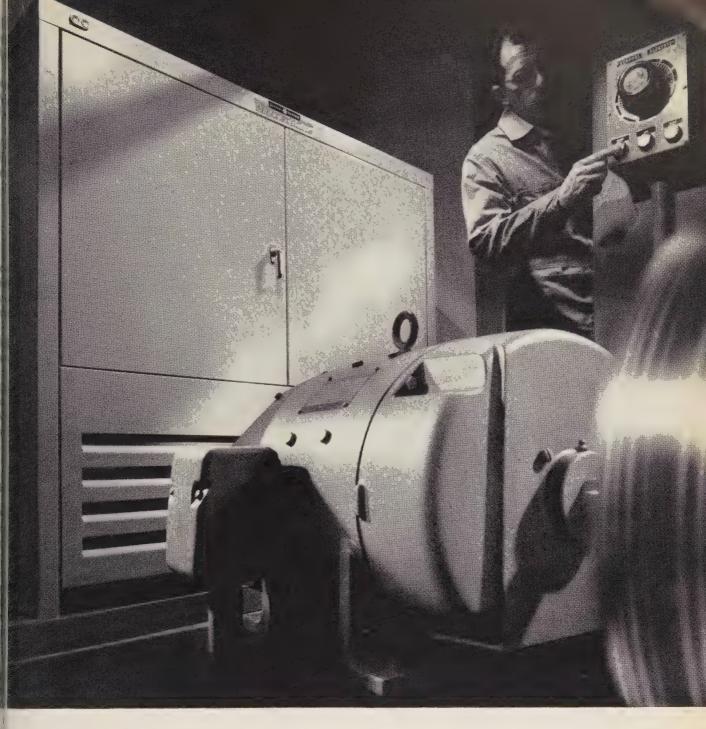
The film deposited is stable 600° F, and will not crack or become brittle at -40° F. Write: At Con Chemical Co., Box 8168, New Orleans 22, La. Phone: Fairvier 3715

Converts to Abrasive

The Model DL air operated, abrasive belt attachment converts an polishing and buffing head unit lathe to accommodate abrasive belt

A contact wheel is mounted of the head or lathe unit spindle are the abrasive belt is placed over the wheel and the idler pulley of the attachment.

Tension is accurately maintaine regardless of work pressure or bestretch. It can be operated at an convenient angle, and comes wit



REASONS WHY YOU SHOULD BUY-

New General Electric Speed Variator

Amplistat Regulator offers better peed regulation and adjustable, med acceleration for improved roduct quality.

. Static Exciter, with silicon rectier, has no moving parts, requires lo warm-up, provides more producon time, less maintenance.

. Two-Unit, Four-Bearing M-G Set atures Tri-Clad† '55' motor for For more information contact your

more dependable performance.

- 4. Front-Connected Controls, recessed wiring troughs make routine inspection easy, cut maintenance time.
- 5. Kinamatic* Drive-Motors provide instant response to control signals. For details on this fast-acting motor see next page.

Apparatus Sales Office or write for GEA-6643. Direct Current Motor & Generator Department, Erie, Pennsylvania.

In Canada, contact Canadian General Electric, Peterborough, Ontario.

† Registered Trade Mark General Electric Co.

* Trade-Mark of General Electric Co.

GENERAL (ELECTRIC



NEW GENERAL ELECTRIC DC MOTOR GIVES

Instant Working Power

KINAMATIC*... a new standard in industrial direct current motors ... designed to deliver drive power at the moment you need it!

Split-Second Response . . . larger air gaps reduce electrical time constants . . . smaller armature diameter permits more rapid delivery of torque to load . . . means faster starts, stops, reversals.

Low Inertia Armature is dynamically balanced, banded with steel and glass . . . gives dependable, high-speed operation . . . skewed armature slots minimize torque pulsation, permit smooth machine operation at low speed.

Other Power Packed Features of new d-c Kinamatic motors help give you more continuous, more automatic production . . . economically.

Additional information is available at your nearest General Electric Apparatus Sales Office. Or, if you prefer, write for Bulletin GEA-6355. Direct Current Motor and Generator Department, Erie, Pennsylvania.

*Trade-Mark of General Electric Company.

Progress Is Our Most Important Product

GENERAL (ELECTRIC

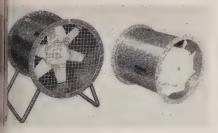


n airline filter and lubricator. The ust hood is optional. Write: Difine Bros. Co., Seward Avenue, Itica, N. Y. Phone: 4-7174

ans for Industry

Pressure-type tubeaxial fans for idustrial applications handle air, imes, and light dusts. They are ecommended for special machining perations.

The Type DT fans are equipped ith matched design motors and ropellers, and are available with ropeller diameters of 8, 12, 16, 20, and 24 in.



Capacities range from 200 to 12,-00 cfpm from free air to 5 in. static ressure. Write: Propellair Div., tobbins & Myers Inc., Springfield, thio. Phone: Fairfax 3-6461

peeds Multilevel Jobs

This Model 540 lift truck is quipped with 48-in. forks and a pecial fork adapter that permits owering of load 84 in. below floor avel

Maximum lift is 12 ft, and overll lowered height is less than 8 ft. For added safety, the 6100-lb capacity truck is equipped with over-





SAVE WHEN THE HEAT IS ON

This 20 pound Ni-Resist casting made for the Schwitzer Corporation by Hamilton Foundry is the turbine casing of a diesel engine turbocharger. Exhaust gases which turn the impeller at speeds up to 90,000 rpm subject the housing to rapid cyclic temperature changes up to 1500° F. Any free scale formed at these temperatures could erode and eventually destroy the impeller blades. Ni-Resist was chosen for this part because it produces practically no free scale, it resists growth and oxidation at high temperatures, and it resists cracking under thermal shock.

Unit production costs are lowered by finding and using the most efficient material available. In this case, Ni-Resist castings combine design flexibility and machinability with long service life under severe temperature stresses. Ni-Resist castings from Hamilton Foundry have dimensional accuracy, uniform machinability, fine surface finish, a low rejection rate, and are delivered on schedule—a combination of factors which lower unit costs and insure Schwitzer's reputation for product quality.

When new and unusual design problems arise in the selection of metal and the casting of parts, you will find that the skill and integrity of your foundry is your best insurance that specifications—and delivery schedules—will be met.

GRAY IRON . ALLOYED IRON . MEEHANITE @ . DUCTILE (NODULAR) IRON . NI-RESIST . DUCTILE NI-RESIST . NI-HARD



HAMILTON

The Hamilton Foundry & Machine Co., 1551 Lincoln Ave., Hamilton, Ohio • TW 5-7491



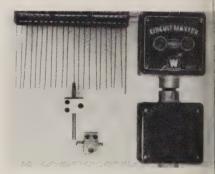


head guard, plus transparent hea shield and drive tire heat shields Capacity and height-of-lift can b

tailored. Write: Towmotor Corp. Cleveland 10, Ohio. Phone: Glenzville 1-0900

Unit Stops Die Damage

This electronic Missing Parts Delector automatically disengages the clutch of a power press when stamped part fails to eject, preventing breakdowns and die damage.



Used with the Circuit Master Mark III, the control provides nonejection detection, overload protection, buckling control, end of material shutoff, and misfeed control Write: Wintriss Inc., 20 Vandam St., New York 13, N. Y. Phone Chelsea 2-0105

Grinds Special Point

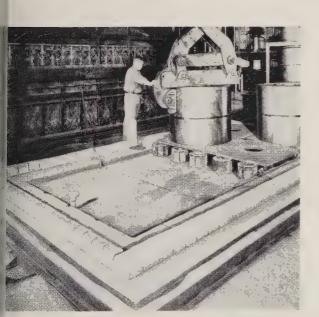
This heavy duty Model No. 21 drill pointer extends drill size range for the Oliver point. Until now, this has been available only on the No. 510 pointer which has a maximum capacity of 3 in. in diameter)

The Oliver grinding technique permits a more intensive clearance



Four-stack strip annealing furnace with a capacity of three 30,000 lb coils on a 34 to 36 hr firing cycle, 68 to 78 hr cooling, operating at a strip temperature of 1320 F in a 8.2% CO atmosphere. The base, $9^{\,\prime\prime}$ thick hearth and portions of the curb are cast of B&W Kaocrete-A.

B&W Kaocrete-A resists CO disintegration and sand penetration at Granite City Steel



B&W Kaocrete-A is cast in the hearths and curbs of these furnaces where firebrick refractory was previously used.

Granite City Steel states that both bases have been in use for over three years without any disintegration resulting from the CO atmosphere. In addition, the monolithic structure of this B&W castable refractory eliminates the destructive effects produced by sand penetrating the joints and cracks of firebrick hearths.

For further information on B&W's specialized refractory castables, write for Bulletin R-35.

4

Strip annealing furnace with a capacity of 70 to 80 tons per charge on a 24 to 48 hr firing cycle, 48 to 96 hr cooling cycle, operating at a strip temperature of 1320 F in a 8.2% CO atmosphere. $4\frac{1}{2}$ " lining of B&W Kaocrete-A is used on hearth and curbs.

&W REFRACTORIES PRODUCTS: B&W Allmul Firebrick

&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick

&W Refractory Castables, Plastics and Mortars

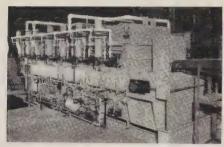
&W Silicon Carbide • B&W Ramming Mixes • B&W Kaowool

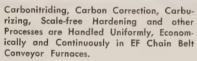


FURNACES

for continuous carbonitriding, carbon correction and scale-free hardening of small parts

175 TO 2000 LBS. PER HOUR







EF Gas Fired Radiant Tube Combination Hardening and Dry Cyaniding Unit Fitted with an Automatic Feeder that Distributes the Parts Evenly on the Chain Belt Conveyor; and a Dual Quench.

The EF chain belt conveyor furnace is one of the most satisfactory continuous heating units yet devised for scale-free hardening, carbon restoration, carbonitriding, carburizing and non-decarb heat treating small and medium size parts. The material is loaded onto our rugged heat resisting cast link conveyor belt; carried through the furnace; heated uniformly to proper temperature; automatically quenched and discharged. No pans or trays are needed. Hundreds in daily operation prove the dependability and efficiency of our design. 11 standard sizes. Capacities to 2000 lbs. or more per hour. Gas, oil or electrically heated. Furnished complete with any desired feeding, discharging or special atmosphere equipment. Write for folders describing our chain belt conveyor type and other production furnaces.

The Conveyorized Partitioned Dual Quench Moves Laterally to Permit either the Complete Oil or the Water Quenching Equipment to be Positioned under the Sealed Furnace Discharge.

This EF Special Atmosphere Unit can Operate as either an Exothermic or Endothermic Generator. Used with EF Continuous Bolt Hardening Furnaces for Scale-free Hardening or Carbon Restoration.







ASK FOR BULLETIN 462-CB.

shows typical installations of EF Gasfired, Oil-fired and Electric Furnaces.

Send for a copy today!

THE ELECTRIC FURNACE CO.

GAS FIRED OIL FIRED AND ELECTRIC FURNACES FOR ANY PROCESS, PRODUCT OR PRODUCTION

Salem - Ohio

Canadian Associates • CANEFCO, LIMITED • Toronto 13, Canada





angle on the point as the drill wais approached.

Standard equipment for the ulincludes $\frac{1}{4}$ hp motor, grindi wheel, diamond dresser, jaw asserblies, and setting gage. Writoliver Instrument Co., 1442 Maumee St., Adrian, Mich.

Strapping Shows Name

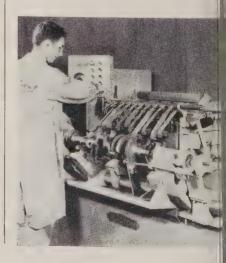
Printon strapping displays the name or message of the user every 2 ft. It is available in seven color and 19 light-duty sizes from 3/4 to 0.012 in. to 3/4 to 0.023 in.

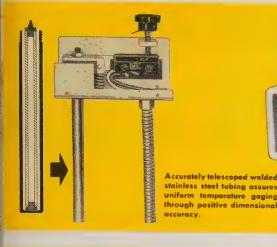
The product is made from hil tensile steel strap, and the edges a deburred. Write: Allegheny State Band Co., P. O. Box 716, Pittsburr 30, Pa. Phone: Walnut 1-7100

Laps Fine Finish

The No. 31 Crank-O-Lap crant shaft lapping machine uses coatt abrasive strips to produce fine sufface finishes.

It offers low cost production fine surfaces on external diameter











Carbon • Alloy • Stainless Steel

Only welded tubing combines the advantages of a tube's hollow form and structural strength with exceptional mechanical efficiency resulting from uniform wall thickness, concentricity, accurate dimensions and general adaptability to fabrication of all kinds.

Welded tubing is available from your quality tube producers in all weldable grades of steel in a full range of sizes.

It's time to design with welded tubing in mind!



Specific information on welded tubing is available on request to:

FORMED STEEL TUBE INSTITUTE

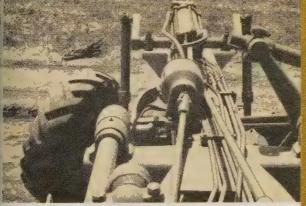
850 HANNA BUILDING . CLEVELAND, OHIO

An Association of Quality Tube Producers

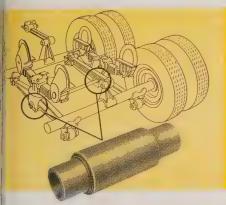
LC-583



Mechanical parts such as hollow shafts or complex exhaust systems are served equally well by welded steel tubing.

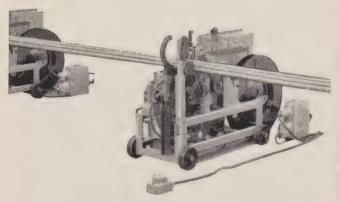


Structural, hydraulic and mechanical applications for welded steel tubing show clearly in this roadbuilding equipment.

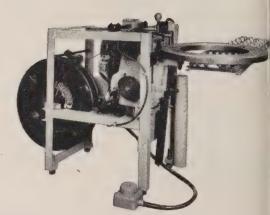


Dimensional accuracy of welded steel tubing makes this bushing economical, eliminates machining.

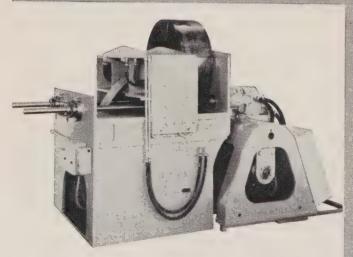
...proved in 73



Signode MS2-B automatic strapping machines are used to bundle conduit, rods, tubing, and small dimension pipe. Usually two or three of these machines are used in line and operated from one control to apply two or three straps simultaneously. MS2-B automatic strapping machines can be adapted to handle and strap bundles of various shapes and sizes. Strapping operation is completed in four seconds.



The M2V machine straps narrow strip coils from 1/4" to 2" wide. Each strap is applied in approximately 11/2 seconds. Automatic and semi-automatic machines of the M2 series have been is steel mill operation since 1946, strapping conduit, rods, tubing, pipes, strip coils, mine rook bolts, and nail cartons.

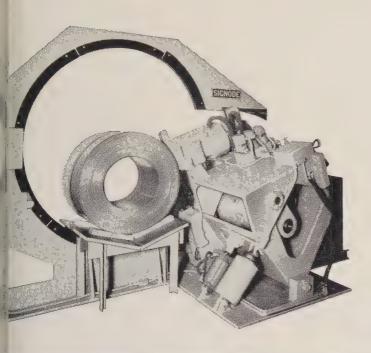


This MH10 series strip coil strapping machine will strap up to 120 coils per hour, three straps per coil. At the touch of a button, the machine tightens outer loops of the coil, squares up edges, positions the coil, and applies the strap to a pre-determined tension of up to 1200 pounds. Similar Signode machines have been in steel mill service since 1948...perform as well on hot coils—1200°F.



This dual automatic MH11 series strapping machine straps rod or wire coils up to 60" O.D. at 110 coils per hour. Machine applies single strap or applies two straps at once. Proper preset tension on every strap makes coils more compact, easier to handle, take less space. Signode wire coil strapping machines have been in steel mill service since 1949.

dependable steel mills



The Signode MH14-34 circumferential strapping machine is a relatively recent development. It automatically, and without adjustment for size, center-straps coils of from 30" to 60" O.D. Capacity is 300 to 400 coils per hour, depending on size. Coils can move through the machine in either direction.

SIGNODE machines reduce strapping and handling costs

The high cost of down-time in a steel mill puts a premium on machine dependability. Signode steel strapping machines have proved dependable—and productive—in 73 mills, some since 1946, in the hardest kind of service. Today's rising steel production gives additional importance to the savings these dependable machines deliver. Look to Signode for strapping machines built to steel mill standards.



SIGNODE STEEL STRAPPING CO.

2645 N. Western Avenue, Chicago 47, Illinois

Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

Fastener Facts

by Dudley H. Campbell, Director of Engineering—Judson L. Thomson Mfg. Co.

SHOULDERED RIVETS VS MACHINED PARTS

When design calls for fasteners that also function as pivots for moving parts, it pays to consider shouldered rivets first. They may look much like screw machine parts that offer similar shoulder and tenon combinations; but the similarity ends there.

Rivets Cost Less!

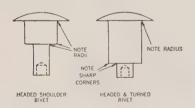
Shouldered rivets cost only about half what you pay for their fully machined equivalents. That's because they can be cold-forged from solid wire in a single, high-speed operation. In most cases, no metal is removed, as with screw machine parts. So, you get all the stock you pay for.

Rivets Speed up Assembly!

Shouldered rivets are located and clinched by high-speed rivet-setting machines. Like semi-tubular rivets, they have shallow punched or drilled holes in their shanks to combine the shear and compression strength of solid rivets with low-cost fastening. On the other hand, comparable screw machine parts often require slow, costly hand locating and fastening.

Therefore, the savings in material and labor costs inherent in shouldered rivets demand their early consideration in cost reduction or value analysis programs. These low-cost, high-speed fasteners should be thoroughly investigated before designs are frozen in favor of more expensive screw ma-

chine parts.



Thomson Shouldered Rivets

Thomson designs and produces shouldered rivets to specifications in two forms; completely cold-headed or cold-headed and turned, depending on permissible radius of corners and

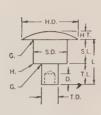
break of edges.

When close tolerances are not a factor as in folding baby carriages, car beds and seats, rollaway beds and comparable pivot-fastener applications, Thomson shouldered rivets are completely cold-headed . . . and, of course, priced at a minimum,

Where tighter fits are necessary, a secondary turning operation supplements the initial cold-forming to square corners and edges to specified tolerances. Metal removal, of course is slight. As a result, these Thomson

shouldered rivets cost slightly more than completely headed rivets, but much less then fully-turned parts.

Variables to Consider



In addition to permissible radi-us of corners (H) and break of edges (G), there are nine other design factors: head shape, the diameter (HD) and thickness (HT); shoulder diameter

and length (SL); tenon diameter (TD) and length (TL); rivet length under head (L) and hole depth (D). Head shapes may be round, oval, flat, countersunk, or some special design. Because of all these variables, Thomson Shouldered Rivets are made to order after individual quotations.

Other Design Factors

It pays to think twice before you rule out shouldered rivets because of design and production consideration that seem to prevent insertion of rivet-setting machine's driver or anvil for clinching the rivets. In many cases, a slight change in spacing or cavity size allows use of rivets without changing overall dimensions. In other cases, a change in assembly sequence permits a profitable switch from costly hand assembly of expensive screw machine parts to low-cost machine-set rivets. Our engineering department, experienced in shouldered rivet applications, will be glad to offer suggestions while your designs are still in the rough-draft stage—at little or no cost. cost.

Materials and Finishes

Thomson Shouldered Rivets are produced from aluminum, brass, copper, nickel-silver, low-carbon steel, stainless steel and other materials. They can be plated with brass, cadmium, copper, nickel, tin, zinc, etc. They can also be oxidized or finished in incorporate allows to metals the oxid in japanned colors to match the original equipment or end product.

Free "Fastener Fact File"

Be one of the first to profit from our new manual on all phases of riveting. It covers rivet types, applications, materials, finishes and other factors that determine selection of the right rivet design and machine for cutting

fastening costs. Request your copy to-day. Write: Judson day. Write: Judson L. Thomson, Mfg. Co., Dept. S, Wal-tham 54, Mass.





NEW PRODUCTS and equipment

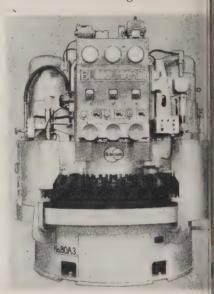
of automotive crankshafts. It cal also be used to improve the finish of other types of parts.

Head and foot stocks are carrid on a swing frame mechanism, fl cilitating loading and unloading Write: Norton Co., Worcester Mass. Phone: Swift 8-2511

Three-Spindle Grinder

The 80-A3 center column, auti matic surface grinder has an 80-i: OD worktable and three grinding wheel spindles.

Each wheel is maintained at con rect height by a finger-type fee control caliper. Work is held fixtures during the grinding cycle The table is nonmagnetic.

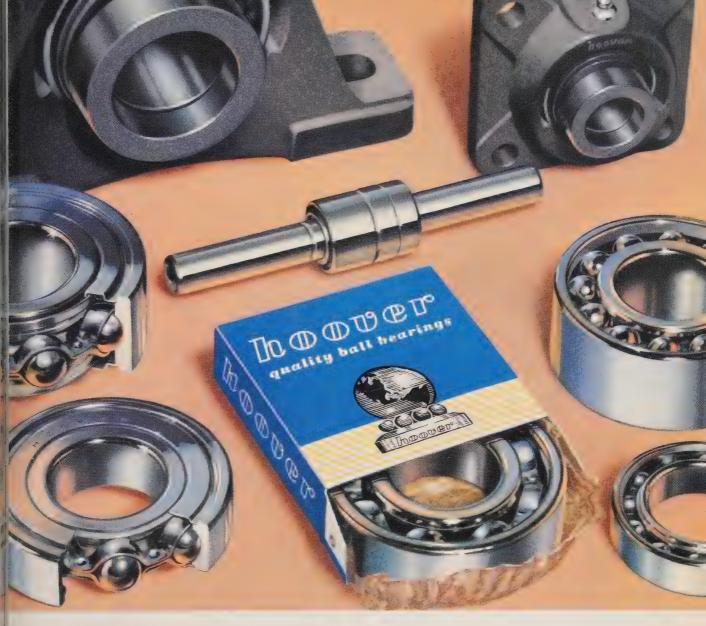


Wheels are 18-in. cylinders 22-in. segments. Feed is manual or power with rapid raising or low ering of wheelheads by power Write: Blanchard Machine Co., State St., Cambridge, Mass. Phon Trowbridge 6-8870

Drive Shaft Mounted

The 315GJ all-steel shaft mount ed drive has a torque rating 41,000 in.-lb at the low speed sha With a ratio of 25 to 1, the un covers a range from 3 hp at 5 rp to 30 hp at 50 rpm.

Features include extradepth, his pressure angle, helical gears will high load carrying capacity an maximum mechanical efficience and three-wall housing (all-steet to maintain rigid alignment of r



www...MORE ball bearing types and a bright, new package

loover is widely known as a leading producer of open, nielded and sealed types of deep-groove ball bearings, ouble row bearings and water pump bearings. These loover products have earned a long standing reputation or quality.

Now, three new series are added to the Hoover line:
) pillow block bearings and companion flange bearings;
) 3L00 extra light bearings for maximum shaft and ninimum housing dimensions; 3) "Super Max"

bearings for maximum capacity applications.

All these new bearings meet Hoover's high quality standards. All are made with smooth *Hoover Honed* raceways and *Micro-Velvet* balls, accurate within millionths of an inch. All are designed for superior performance and long life.

New, too, is the distinctive blue and yellow package, designed to help you recognize Hoover bearings quickly and to remind you that they are tops in quality.

Indower

BALL AND BEARING COMPANY

5400 South State Road, Ann Arbor, Michigan

Los Angeles Sales Office and Warehouse: 2020 South Figueroa, Los Angeles 7, California

Right Identifies Bearings Pictured Above tares to Check the Information You Want

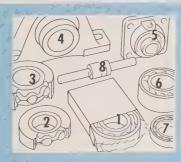
ingle Row Deep roove Bearing.

ubricated-for-life Bearing ith Seals of TEFLON*.

artridge Bearing.

illow Block Bearing.

- 5 Flange Bearing.
- 6 Double Row Bearing.
- 7 3L00 Extra Light Bearing.
- 8 Fan and Water Pump



Name	
Title	
Company	

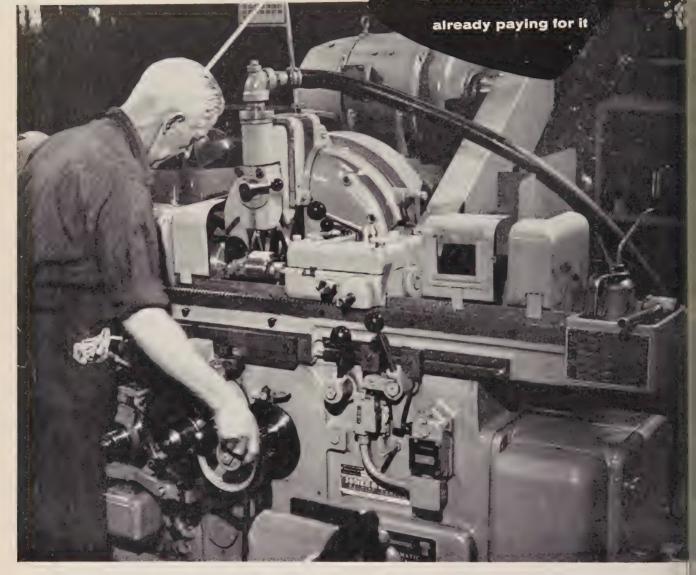
Address Zone State

Hoover Honed and Micro-Velvet are Hoover trademarks. *TEFLON is a DuPont trademark.



the man who needs

a new machine tool is



Close Tolerance Tool Room Work on an Automatic machine with Universal Application

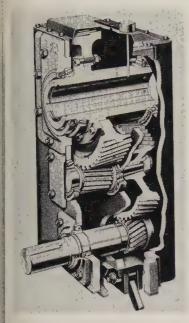
A customer writes: "The versatility of Jones & Lamson Thread Grinders is scarcely tested in the conventional production of hobs, taps, gages and threaded parts. In our toolroom, using the thread grinder as a basis for 'Rube Goldberg' development, we have produced precision racks, small form-profiled milling cutters, oil grooves and grinding wheel crushers.

"While serving the purpose as a necessary piece of equipment, this machine

also provides a means by which many additional production problems can be explored and tested. Applying the thread grinder to toolroom problems is putting the best foot forward for quickly producing accurate and dependable shop accessories."

Write for catalog 600. Jones & Lamson Machine Company, 517 Clinton Street, Springfield, Vermont.





olving elements. Write: Dept. 255 dalk Corp., 3001 W. Canal St., filwaukee 1, Wis. Phone: Division 1-3131

athe Has Rapid Indexing

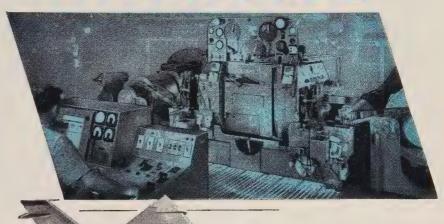
A small turret lathe, the Chalenge 625, offers accurate and fast tachining of small parts. Its rapid idexing control enables the operaor to return the turret to the starting position, regardless of the numer of operations performed.



A steady rest permits accurate entering of parts to be machined. t is possible to hold parts within 1,0002 in. The steady rest opens nd closes automatically at the tart of the cutting cycle. Write: Challenge Machinery Co., Grand Taven, Mich. Phone: 2800



miracles



Stainless steel and super metals have so many desirable characteristics — corrosion resistance, strength, hardness, beauty, workability — they are often termed "miracle metals." But they can perform miracles only if you select the right analysis for your particular application. Wallingford is more qualified than ever to help you do this. Now, an all-new metallurgical laboratory and a larger staff of expert technicians are at your service.

In such fields as nucleonics, aviation and guided missiles, stainless steel and super metals will accomplish miracles only when gages can be held to the close tolerances demanded. Wallingford's Sendzimir Mills, equipped with non-contacting, continuous gages, assure this. A feed-back system provides fully automatic correction of the mills to maintain strip thickness with required tolerances at all times. These mills make Wallingford one of the few companies capable of producing precision strip in widths up to 27" and as thin as .001"... and give Wallingford the largest foil capacity in the country.

Investigate Wallingford's ability to provide stainless steel and super metals that will perform "miracles."

THE WALLINGFORD STEEL CO.



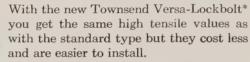
Progress in Metals for over 36 Years

WALLINGFORD, CONN., U.S.A.

COLD ROLLED STRIP: Super Metals, Stainless, Alloy
WELDED TUBES AND PIPE: Super Metals, Stainless, Alloy







Wider grip ranges in a given size are provided by additional locking grooves. Other design changes make it feasible to use them in relatively oversized holes. Inspection time is reduced since hole size

These features make for flexibility of design-make calculations simpler and more accurate.

Versa-Lockbolt installation is fast and guns provide uniform draw down or clinch —locking the collar with up to five tons of pressure. The new collar with its flanged integral washer makes it especially suitable for fastening even light gage materials.

For more information on how to get new vibration-proof fastening economy. write Townsend Company, P.O. Box 237-C, New Brighton, Pa.

*Licensed under Huck patents RE 22,792; 2,114,493; 2,527,307 2,531,048; 2,531,049 and 2,754,703

The Fastening Authority COMPANY . ESTABLISHED 1816

NEW BRIGHTON, PENNSYLVANIA

Sales Offices in Principal Cities

Cherry Rivet Division . Santa Ana, California

Write directly to the company

Immersion Heaters

A guide, GEA-6306, tells how to sele immersion heaters for heating oil, a thermostats and controls for regulating temperatures. General Electric Co., Sc. nectady 5, N. Y.

Graphite Data

A comprehensive collection of techni data on manufactured graphite is in handbook of engineering data. Grapp tables, and curves relating to graphit use in a wide range of industries are p sented. National Carbon Co., a divisi of Union Carbide Corp., 30 E. 42nd New York 17, N. Y.

Tubeaxial Fans

Performance and dimension specific tions on the Series 300 Tubeaxial Fa are available in Catalog 1110-B. Sturteva Div., Westinghouse Electric Corp., Hyl Park, Boston 36, Mass.

Air and Gas Cleaning

Bulletin SC-1047 tells how Vape-Sorb provide clean, dry air and gas for me fabricators, steel plants, and other inditries. Fourteen standard sizes are availab Selas Corp. of America, Dresher, Pa.

Marking Tools

Marking tools, machinery, and equi ment are covered in Catalog No. 16 (1 pages). Sections include data on graved stamping dies, type and holders, and embossing and coining d Dept. S, Geo. T. Schmidt Inc., 4100 Ravenswood Ave., Chicago 13, Ill.

Hand-Operated Cranes

Specifications and capacities of the Bunderslung single bridge, hand-operate crane are covered in a folder, DH-455-Units have capacities of 1 to 10 to: and spans to 50 ft. American Chain Cable Co. Inc., 929 Connecticut Av Bridgeport 2, Conn.

Carbide Cutting Tools

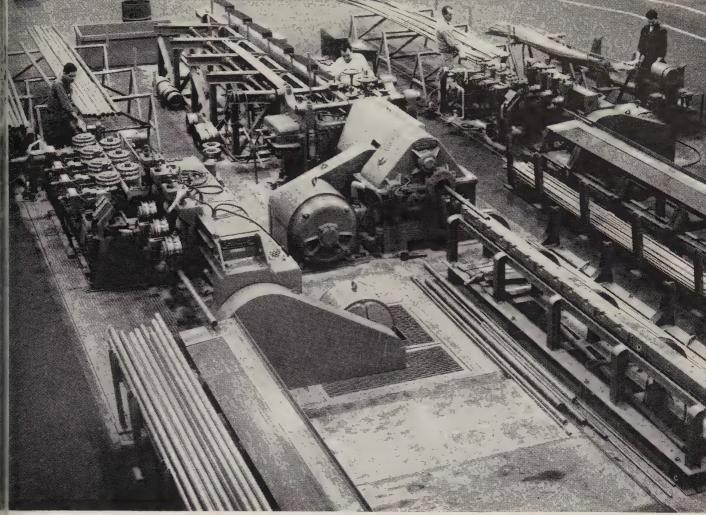
Carboloy cemented carbide cutting to materials and a new pricing system a described in a catalog. Metallurgical Proucts Dept., General Electric Co., 111 E. Eight Mile Rd., Detroit 32, Mich.

Boring Mills

Floor-type horizontal boring, drilling and milling machines with 4 and 5 i spindles, are described in a detailed cat log. Cincinnati Gilbert Machine To Co., 3366 Beekman St., Cincinnati 2 Ohio.

Dust Collector

The Microdyne dust collector is a w inertial type that is installed as part the duct. Collection efficiencies are per cent of all dust 5 microns in sil



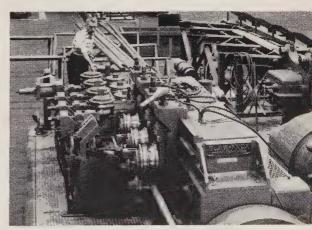
arican Brass finishing bay equipped with Blaw-Knox Medart Straighteners.

merican Brass selects BLAW-KNOX ledart Straighteners for its newest mill

American Brass Company plant in Los Angeles is the est and the largest copper and brass manufacturing ration in the West. To handle the entire output of r widely diversified product range, American Brass Blaw-Knox Medart Straighteners.

o handle the bulk of the tubing output, two high speed -plane roller leveller type straighteners were used. se machines feature the patented Blaw-Knox Medart angement of overhung quick change rolls with variable centers. For work requiring exact precision straight-tolerances a 2-roll rotary type straightener is used.

the Blaw-Knox Medart installation in this modern al-working plant is typical of the wide acceptance of w-Knox Medart equipment, the most complete line red in Bar and Tube Machinery for both ferrous and ferrous plants. Your Blaw-Knox Medart sales engitive will be glad to help you select the machine best ed to your product.



Roller leveller straightens brass tubing at high speeds.



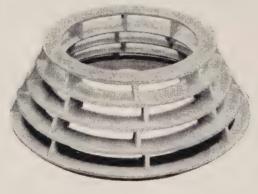
BLAW-KNOX COMPANY

Foundry and Mill Machinery Division Blaw-Knox Building • 300 Sixth Avenue Pittsburgh 22, Pennsylvania

DURALOY

HIGH ALLOY CASTINGS To your order

LARGE
SMALL
SPECIAL SHAPES
CORROSION RESISTANT
HEAT RESISTANT
ABRASION RESISTANT



Duraloy is the BEST place to come for your high alloy casting requirements. We are specialists in turning out castings to order. Simple jobs, tough jobs; large jobs, small jobs. Static cast or centrifugally cast...you name it and we'll produce it.

The melt, the casting and the finishing are all carefully controlled and quality tested by our technicians. Our test equipment, including 400,000 volt X-ray and gamma-ray facilities, is just one way Duraloy assures delivery of Better High Alloy Castings.

Send for Bulletin No. 3354-G.

7

URALOY Company
OFFICE AND PLANT: Scottdale, Pa.

EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.

ATLANTA OFFICE: 76-4th Street, N.W.

CHICAGO OFFICE: 332 South Michigan Avenue
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

NEW LITERATURE . . .

(80 per cent in the 1 micron rang Bulletin J-616 gives details. Joy Mfg. (1) Oliver Bldg., Pittsburgh 22, Pa.

Insulation

Ccrafelt insulation provides heat countries to 2000° F with only a fraction an inch of thickness. This versatile fractory-fiber felt insulation is described in a folder, IN-200A. Johns-Manys Corp., 22 E. 40th St., New York 16, N.

Ultrasonic Cleaners

Quality, mass produced SonBlass ultrasonic cleaners are described inn catalog. Units range from 35-watt 2.5-kw systems, with related transducin capacities from 3/8 to 75 gallons. Natu Ultrasonics Corp., 625 Main St., Wobury, N. Y.

Optical Gaging

Over half the 114 pages in Catalog I 10 are devoted to information on technical subject of optical gaging. Opti Gaging Products Inc., Rochester, N. Yi

Portable Heaters

Portable space heaters are described Catalog No. 5815. Stow Mfg. Co., Shear St., Binghamton, N. Y.

Water Requirements

The reasons for the extreme water put ty requirements in nuclear cycles, incluing considerations of efficient heat transfer, radioactivity, corrosion, materials cycle construction, and fuel element from ture are discussed in Technical Reprint T-162. Graver Water Conditioning CT 216 W. 14th St., New York 11, N.



NEW BOOKS

Standards of the Expansion Joint Marifacturers Association, Technical Commtee of the Expansion Joint Manufaturers Association, 53 Park Place, No. York 7, N. Y. 31 pages, \$1

Up-to-date information concerning the origin, construction, application, and testing of expansion joints for piping as other services are contained in this firedition. Much of the information Henever been published in any text or reference book.

Elevated Temperature Properties of Chrimium Steels, American Society for Teking Materials, 1916 Race St., Philadle Phila

phia 3, Pa. 124 pages, \$4.25
This report is a graphic summary of televated temperature strength propert for chromium steels. It includes da on tensile strength, yield strength, elong tion, rupture, and creep propertii Twenty-three alloys, ranging from 12
27 per cent chromium, are covered. Thook was prepared under the auspid of the Data and Publications Panel the ASTM-ASME Joint Committee on Effects of Temperature on the Propertic of Metals.



Norfolk and Western Uses Load-O-Matic for Heavy-Duty Car-Shop Production



50-hp hoist drive unit for this crane includes Westinghouse Life-Line® Motor, d-c self-adjusting brake and rectifiers.

At the Norfolk and Western Railway's main car-shop in Roanoke, Virginia, this modern 25-ton Whiting crane, equipped with Westinghouse Load-O-Matic* a-c control system, handles heavy plate and other materials for car manufacturing operation.

Because Load-O-Matic is a rugged, yet precision system built to heavy-duty industry standards, it is highly favored for applications that must have long-term, low-cost service, ease of operation and low-maintenance cost.

The Load-O-Matic system with stepless speed control over the full load range eliminates initial cost and complexity of d-c conversion equipment. Components, including controls, motors, brakes and gearing, are Westinghouse Power-Up products, built to work together and backed by Westinghouse unit responsibility.

To see Load-O-Matic in operation, call your Westinghouse salesman. For complete information, write Westinghouse Electric Corporation, 3 Gateway Center, P.O. Box 868, Pittsburgh 30, Pa. JI-96125

*Trade-Mark

YOU CAN BE SURE ... IF IT'S

Westinghouse

NEW





and important

From STAINLESS and STRIP DIVISION



exclusive basic oxygen steel cold rolled strip

especially advantageous for deep drawing requirements

High purity, ductile, Basic Oxygen Steel is now available for the first time in restricted specification cold rolled strip. Low phosphorous, sulphur and nitrogen content characterize this new product. The combination of this high quality low carbon steel and the controlled processing typical of J&L's Restricted Specification Strip, results in a new product

with many fabricating advantages. For deep drawing and intricate forming operations, superior yields and lower costs may be anticipated. The extent to which this new product may benefit your product deserves immediate investigation. Your inquiry will receive our prompt and interested attention.



J&L STAINLESS and STRIP DIVISION produces a full line of restricted and standard specification strip steel in these grades and types:

> Low Carbon High Carbon Tempered Spring Steel Electrolytic Zinc Alloy **Stainless**

Jones & Laughlin

STAINLESS and STRIP DIVISION YOUNGSTOWN 1, OHIO



Market Outlook

December 15, 1958

Supreme Court Aids Pipe Producers

LINE pipe shipments may jump 30 per cent next year, thanks to the Supreme Court. Last week it gave natural gas companies all the encouragement they needed to resume expansion programs that were suspended 13 months ago (see Page 85). By reversing the "Memphis decision" of November, 1957, it restored their authority to raise rates without first obtaining the consent of all their customers.

Hit by recession as well as by the Memphis decision, line pipe shipments have plummeted from last year's record high of 4.2 million tons to this year's estimated 2.6 million. The outlook for 1959 is encouraging, but few producers think more than half the lost ground will be recovered. Full impact of the court's ruling won't be felt until 1960, when shipments may set a record.

OIL COUNTRY PICKUP?— Manufacturers of drill pipe, tubing, and casing hope the revival of interest in pipeline programs will also mean better business for them. They believe gas producers will have to drill more wells to supply their expanding markets. Drillers' inventories of the popular sizes of tubing and casing are thought to be abnormally low.

A rally seemed to be in the making before the Memphis reversal was announced. Tubemakers say oil country business has perked up markedly in the last two weeks. Three major oil companies have indicated that they'll start buying for inventory next month. They fear a midyear steel strike and subsequent price hikes.

ALCOA'S MOVE WEIGHED— The announcement by Aluminum Co. of America that it won't change its prices through the first half of 1959 is welcome news to steel consumers. They figure it will discourage any plans to hike extras in January or February—a move that has precedent.

AUTO UPTURN CONTINUES—During the final third of November (seven selling days), auto dealers sold 129,500 new cars. Their daily average of 18,500 was 14 per cent higher than that of the middle third of the month and the best of any like period in 1958. Dealers said their sales improved because they were better stocked. For the first time, they could offer buyers a full selection of models and colors.

Automakers are continuing to boost their production. They hope to turn out 600,000 cars this month. Although they're still buying steel on

short leadtime, there's talk of inventory building. It's believed that one of the Big Three will soon place orders for March and April delivery.

TIN PLATE SNAPS BACK— Tin plate shipments fell sharply last month as consumers worked off inventories they accumulated in anticipation of a Nov. I price increase. November shipments from one mill were only a third as large as October's. Another producer's shipments dropped to less than 30 per cent of the previous month

December business is on the upgrade. Can companies are buying for January production. Their October purchases were limited by two considerations: 1. They didn't want to invest too much money in a stockpile. 2. They didn't want to pay heavy taxes on a big yearend inventory. Shipments of electrolytic tin plate will reach a record high this year: About 5.4 million tons.

PRODUCTION INCREASES— Last week, steel-making operations advanced 1 point to 75.5 per cent of capacity, the highest point of the year. Production was about 2,038,000 net tons of steel for ingots and castings.

WHERE TO FIND MARKETS & PRICES

	News	Prices			Prices
Bars, Merchant	183	189	Nonferrous Met.	202	204
Reinforcing .	183	190	Ores	184	195
Boiler Tubes		192	Pig Iron	184	194
Canada			Piling		189
Clad Steel		193	Plates	181	189
Coke		195	Plating Material		205
Coal Chemicals.		195	Prestressed Strand		n
Finished Steel		187	Price Indexes		187
Ingot Rate .	186		Producers' Key.	190	
Scrap Prices.		199	R.R. Materials.		192
Comparisons		187	Refractories		195
Contracts Placed	184		Scrap	198	200
Contracts Pend.	185		Semifinished .		189
Electrodes		195	Service Centers	185	194
Fasteners		192	Sheets	180	190
Ferroalloys		196	Silicon Steel Stainless Steel .	186	191 193
Fluorspar		195	Strip	180	191
Footnotes		192	Structurals	184	189
Imported Steel	184	195	Tin Mill Prod		191
Ingot Rates	186	,,,	Tool Steel	101	193
		195	Tubular Goods.	181	193 191
Metal Powder.		190	Wire	100	171

^{*}Current prices were published in the Dec. 1 issue and will appear in subsequent issues.

This resistance welder has 48 Aeroquip Hose Lines giving long, trouble-free service conveying hydraulic fluids. Hose lines were made up in the plant using Aeroquip Hose and Reusable Fittings. No special machines are needed to assemble Aeroquip Hose Lines. Assemblies can be made in minutes using a wrench and a vise.

The high pressure hydraulic lines on this lock seam machine replaced steel tubing over 4½ years ago and are still in good condition despite constant vibration.

Aeroquip Hose Lines Give Long Service on Plant Equipment

at Hayes Industries, Inc.

Use of Aeroquip Flexible Hose Lines has increased service life of hydraulic and air lines on plant equipment at Hayes Industries' Jackson, Michigan, plant. Replacing steel tubing on one hydraulic machine, Aeroquip Hose Lines have given trouble-free service for more than $4\frac{1}{2}$ years.

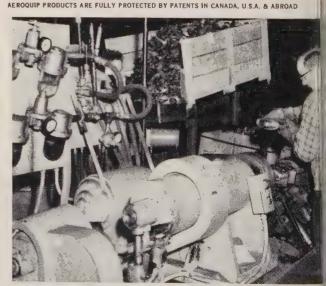
All replacement hose lines are assembled quickly right in Hayes' plant from Aeroquip Bulk Hose and Reusable Fittings. Equipment downtime is minimized and hose line stock is limited to a few coils of hose and spare fittings.

Standardize on Aeroquip Hose Lines for your fluid line replacements. You save time and money. Call the Aeroquip Distributor listed in your Yellow Page Phone Book or write us.



AEROQUIP CORPORATION, JACKSON, MICHIGAN

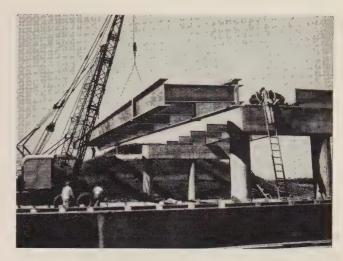
INDUSTRIAL DIVISION, VAN WERT, OHIO • WESTERN DIVISION, BURBANK, CALIFORNIA AEROQUIP (CANADA) LTD., TORONTO 19, ONTAR.O



Air lines on this head roll machine in Hayes' Jackson plant a Aeroquip medium pressure and high pressure hose lines. They wiv stand air surges and vibration.



rom rugged military vehicles . . .



To modern highway bridges

Structural Aluminum Begins To Move

/ATCH aluminum structurals. his market, a mere sprout in the te 1940s, is ready to burst into all bloom.

Its size (probably less than 5 er cent of aluminum shipments) in fool you. The best way to gage in the future of these products (inuding heavy sheets and plates, beams, T-sections, and channels) to look at their application pointial.

Here are some present uses:

Bridges-Last September, the wa State Highway Commission edicated the world's first alumium girder highway bridge (see hoto at right above). Measuring 22 ft, it's all aluminum except or the concrete deck. Several simir bridges are going up elsewhere. lost industry people feel the big otential is not in using aluminum s a replacement for steel bridges. hey hope to realize their goals by esigning units for aluminum. Both ne Fairchild bridge and Reynoldsaroni bridge express that philosohy. They were introduced within few weeks of each other this year see Steel, Sept. 1, p. 30; Oct. 27,

Electric Utilities—A prefabriated, all-aluminum substation was ioneered last spring by Kaiser luminum & Chemical Corp. Alu-

minum Co. of America has contracted with a New Jersey power company for 60 all-aluminum transmission towers, the first such application for the light metal.

• Transportation—Aluminum has more than surface penetration in this field. Some examples: Truck and trailer bodies, military vehicles, aircraft, railway tank, gondola, and hopper cars.

Other uses are numerous. They include: Building girders and other structural components, conveyors and cranes, oil well drilling platforms, building dome structures, storage tanks, framing for exposed structures such as bus and train station shelters, ship hulls, and deck houses.

• Selling Points—Why use structural aluminum? The industry's answer: Lightness, corrosion resistance, ease of fabrication, high resilience, and impact resistance. Because aluminum can be extruded, another talking point is "the ability to achieve stronger sections through more efficient design of the shape in the section." For construction applications, producers also cite: Simplicity of erecting prefabricated sections, simpler and less expensive transportation of materials to the job area, and ease of joining. In electrical structural uses,

you get the added arguments of reduced maintenance, greater safety, and simplified grounding. Aluminum truck marketers talk about increased payload, less downtime, and high strength to weight factors.

• Welding Is Key—The aluminum structural market owes its rapid progress mainly to the development of high strength weldable alloys and to the perfection of inert gas, shielded arc processes. Aluminum people believe its potential will grow even more as refinements and advances are made in welding techniques.

Other technical breakthroughs should not be overlooked. Aluminium Ltd. Sales Inc. says: "Large rolling mills and extrusion presses have made it possible to meet demands of designers which could not have been fulfilled until a few years ago." Kaiser cites new and larger lock bolts for field joining as an engineering advance that will buoy structural sales.

Also contributing to growing acceptance is the availability of sheets in widths over 100 in.; plates over 1/4 in. thick, with widths up to 120 in.; and extrusions which can be produced within a 20 in. circle.

• At Whose Expense?—Where aluminum structurals are used, they generally replace steel. Sometimes

timber or masonry are the victims. "In a variety of more difficult applications, aluminum may replace any structural material," says the Metals Div. of Olin Mathieson Chemical Corp. "This is particularly true in inaccessible regions and rigorous climates."

It's not merely a question of substituting aluminum for other structural materials. As Kaiser puts it: "Aluminum is being used in many new design concepts where other materials would be unsatisfactory." Reynolds Metals Co. makes this

point: "Our next step is the development of standard structurals especially designed for aluminum."

• Who Makes Them—Primary producers, with their large sheet mills and extrusion presses, fabricate about 95 per cent of the structurals. A few independents operate extrusion presses of sufficient size to compete with other medium-sized extruded structural sections. In general, integrated producers make the structurals, prime contractors do secondary fabrication.



This new Miller development improves quality, speed and range of tungsten inert gas welding in all automatic fixture and manual applications. Balanced wave (BW) characteristic results from new Miller balance control which eliminates the d-c component present in most welding currents. Output of the Miller BW welder is ONLY pure a-c, DELIVERS:

Excellent arc stability
Maximum heat
Deeper penetration
Faster welding speeds

Complete particulars will be sent promptly upon request.

ENTITIE P ELECTRIC MANUFACTURING COMPANY, INC., APPLETON, WISCONSIN

Sheets, Strip . . .

Sheet & Strip Prices, Pages 190 & 191

Demand continues higher sheets than any other major st product. Volume is slipping st sonally as the holidays approar Little change is reported in delivipromises on the principal gradwith hot rolled quoted around the to four weeks, and cold rolled fl to six.

Deliveries on coated sheets extending the first quarter of myear, except on conventional hidipped galvanized which run around eight weeks. Shipments of siling sheets are a little easier than the were recently, reflecting, partly, seasonal drop in small motor-drivappliances.

Midwestern mills report me forward ordering. Automotive at appliance requirements provide this biggest consuming outlets. It lack of push for fast deliveries dicates that manufacturing needs a cushioned to some extent by investories.

Apparently, General Motors Co. is the only automotive firm to cor mit itself to an inventory build in March and April. Ford st isn't definite, telling steelmen going to try to keep inventor low as long as possible. The stee makers think Ford will fill its nee from its own mills if a steel stri is experienced in mid-1959. Fig. steelworkers are members of United Auto Workers, Local 66 not the United Steelworkers. Chri ler's plans are indefinite pendil settlement of its labor problems wi the UAW.

Appliance makers appear to more eager to build steel invertories, but many are holding to see what the auto companies. Some warehouses and smaller coverters say their larger customs are asking them to buy ahead from the mills and hold the stocks their future use. That is being done in the case of hot-rolled sheet in quantities not exceeding 20 to 400 tons.

A Pittsburgh sheetmaker is her ily booked up for first quarter, a anticipates a "terrific first half."

Wire . . .

Wire Prices, Pages 191 & 192

December shipments of manufacturers' wire will equal November

ports a Pittsburgh district pro-

"The upturn began at midyear," said, "and every month since ly has been better than the one eceding it. Automakers are chiefresponsible for the pickup, but ey're not buying ahead. They're unting on delivery in three or ur weeks. As a result, we're only e-third booked for January."

Fourth quarter shipments of anher maker will exceed those in e corresponding 1957 period, even ough foreign competitors have ken about 10 per cent of its east ast rod business.

Forward buying is slow, but orrs for January are ahead of Dember's and are about back to the ctober-November level. Coldading grades and upholstering ils are slightly more active.

Deliveries, except for high carbon ecialties, are not lengthening. eavy stocks of finished wire hardare held by industrial supply disbutors have been worked down. Demand for wire fabric is seasonly slower. There are rumbles in e Detroit market concerning a ice increase after Jan. 1, but some oducers doubt the likelihood of ch action.

lates . . .

Plate Prices, Page 189

Tank and boiler shops are buyg plates hand-to-mouth. Ship ecifications are off slightly, but e development may be temporary nee there are some signs of conued activity in shipbuilding. Last eek, Bethlehem Steel Co. decided keep ship repair facilities at its aten Island (N.Y.) yard in opation past the end of the year.

Requirements from machine tool and heavy equipment builders are otty, and railroad car needs, while a slightly, are still small.

Continued dull market conditions e reflected in easy deliveries. Buys have no trouble getting sheared urbon plates in two weeks and less, licon plates in three to four weeks, and alloy plates in four weeks.

Despite the generally dull maret, a Pittsburgh mill reports its late bookings are strong for Dember—easily the best of the year. Is January prospects are uncertain, ut the outlook for the first half of 359 is thought favorable.

buyer is placing orders as far ahead as June to assure prompt deliveries.

Some steel market observers figure the potential tonnage of steel plates for pipeline requirements in the near future at about I million.

Tubular Goods . . .

Tubular Goods Prices, Page 193

"We've had a marked increase in oil country business the last ten days," reports a Pittsburgh tubemaker. "Standard pipe sales are steady, but conduit is in a seasonal decline. Combined shipments for December will be better than last month's. Some customers are ordering for first quarter delivery."

Another maker booked tonnage for first quarter delivery from one of the major oil drillers. He thinks first quarter, 1959, volume will better that in both the third and fourth quarters of 1958.

Some producers of line pipe and oil country goods anticipate a pickup in buying as a result of the Su-

STAINLESS COSTS LESS THAN ALUMINUM—



stainless steel sheet for curtain wall panels is usually equal to or lower than aluminum when compared in thicknesses of equal indentation resistance? For example, Type 302 stainless steel, .022" thick is equal to .051" aluminum and costs only 62¢ per sq. ft., as compared to 67¢ per sq. ft. for 3003-H14 anodized aluminum.

For additional information on all gauges, fill in and mail the coupon.

Washington Steel Corporation

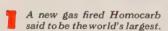
WASHINGTON, PENNSYLVANIA

2	MAIL COUPON Today!
	WASHINGTON STEEL CORPORATION 122-0 Woodland Ave., Washington, Pa.
1	Gentlemen: Please send me full information on comparative costs of stain less steel vs. aluminum for curtain wall panels
į	Name
1	Position
ì	Company
-	Street
i	City Zone State .

WORLD'S largest CAS FIRED FURNACE

YOU CAN FIND BOTH THE BIGGEST AND THE BEST A YOUR COMMERCIAL HEAT TREATER





A Vacuum Heat Treating Furnace for special materials.

Large capacity vertical furnace for heat treating large parts.

The three furnaces shown on this page are units of the facility of commercial heat treating plants in three different section of the country.

Today, with the ever growing demand for better heat triing, economical volume equipment of this sort is become essential and the commercial heat treater has been alery industry's requirements.

Quality work and versatility are the keynotes of this inctry's objectives when treating the thousands of vital, intricand costly components of important products.

Whatever your heat treating problem, and whether involves pounds or tons, always consult your commercial prints.

THERE'S A HEAT TREATING SPECIALIST NEAR YOUR PLANT

American Metal Treatment Co.
Elizabeth, New Jersey
Anderson Steel Treating Co.
Detroit, Michigan
Benedict-Miller, Inc.
Lyndhurst, New Jersey
Bennett Heat Treating Co., Inc.
Newark 3, New Jersey
Commercial Metal Treating, Inc.
Bridgeport, Conn.
Cook Heat Treating Co. of Texas
Houston 11, Texas
The Dayton Forging & Heat Treating

Cook Heat Treating Co. of Texas
Houston 11, Texas
The Dayton Forging & Heat Treating Co.
Dayton 3, Ohio
Dominy Heat Treating Corp.
Dallas, Texas
Drever Company
Philadelphia 33, Pennsylvanio
Greenman Steel Treating Company
Worcester 5, Massachusetts

Fred Heinzelman & Sons
New York 12, New York
Alfred Heller Heart Treating Co.
New York 38, New York
Hollywood Heat Treating Co.
Los Angeles 38, California
Ipsenlab of Rockford, Inc.
Rockford, Illinois
L-R Heat Treating Company
Newark, New Jersey
The Lakeside Steel Improvement Co.
Cleveland 14, Ohio

Metallurgical, Inc.
Minneapolis 14, Minnesota
Metallurgical, Inc.
Kansas City 8, Missouri

Kansas City 8, Missouri New England Metallurgical Corp. South Boston 27, Massachusetts Owago Heat Treat, Inc. Apalachin, New York Paulo Products Company
St. Louis 10, Missouri
Pittsburgh Commercial Heat Treating Co.
Pittsburgh 1, Pennsylvania
Pittsburgh Metal Processing Co., Inc.
Pittsburgh 15, Pennsylvania
The Queen City Steel Treating Co.
Cincinnati 25, Ohio
J. W. Rex Company
Lansdale, Pennsylvania
Stanley P. Rockwell Company
Hartford 12, Connecticut
Scott & Son, Inc.
Rock Island, Illinois
Syracuse Heat Treating Cop.
Syracuse, New York
Temperature Processing Co.
North Arlington, New Jersey
CANADA
Ipsenlab of Canada Ltd.

Toronto,

eme Court's reversal of the lower urt's ruling in the Memphis gas te case. (See Page 85 for details.) Mechanical tubing sales are risg. Automotive demand is chiefresponsible. Shipments to maluinery and industrial equipment akers are also improved, and farm plement manufacturers epped up their buying. Warebuses are ordering on a month-toonth basis.

Pressure tubing sales are being aintained at a fair level. Boiler anufacturers are providing suport, offsetting weakness in other

Producers of cast iron pipe report asonal dullness, but they anticiate renewed buying interest as soon s municipalities enter the market

Ir their spring needs.

Within 90 days, Lone Star Steel o., Lone Star, Tex., will be proucing black pipe for general use. he expansion of the product mix being made with only minor hanges in equipment, reports E. B. ermany, president.

leinforcing Bars . . .

Reinforcing Bar Prices, Page 189

Stone & Webster Engineering orp., Boston, is placing 100 tons f reinforcing steel around the base f a structure which will house the uclear reactor of the Yankee tomic Electric Co. powerplant, lowe, Mass.

The structure, which will be enlosed in a steel sphere having a iameter of 125 ft, will require 00 tons of steel and 12,000 tons f concrete.

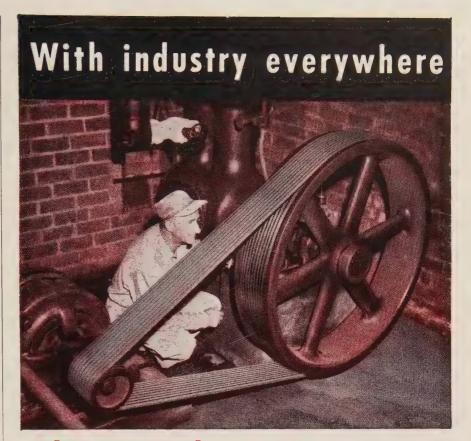
iteel Bars . . .

Bar Prices, Page 189

Pressure on bar mills for deliveries as let up slightly, but automotive equirements are still increasing, particularly for components. Partnakers are ordering hot and cold olled carbon bars, and also hot and old rolled alloy tonnage.

A barmaker in the Detroit area eports he's fully booked up for Deember and his order book for anuary is half filled. Most of his shipments are to automakers who are carrying about a 26-28 day bar nventory.

Demand for stainless steel bars



the No. 1 choice is the V-belt with concave sides

It is easy to see why concave sides insure far longer belt life...and make Gates V-Belts the first choice of industry everywhere.

Just make this simple test: bend a Gates V-Belt as if it were going around a sheave. Feel how the concave sides (Fig. 1) fill out ... become perfectly straight (Fig. 1-A).

Note how this belt thus makes full contact with the sides of a sheave...grips the sheave evenly, distributing wear uniformly across the sides of the belt. Uniform wear lengthens belt life — keeps costs down.

With a straight-sided belt (Fig. 2) the sides bulge out when the belt is bent, and wear is concentrated on the bulge (Fig. 2-A). Uneven wear shortens belt life - increases belt costs.

Because Gates V-Belts with concave sides are so universally preferred, they are also the most widely available. There are Gates Distributor stocks in industrial centers throughout the world.



(NO. 1813698)

The Gates Rubber Company, Denver, Colorado



is unchanged from that a month

Deliveries on hot rolled carbon bars now range two to four weeks, depending on rolling cycles.

Imported Steel Sales Increase in Southwest

Imported steel volume is cutting down domestic sales in the Southwest. In addition to dominating sales of reinforcing bars, importers are making inroads in the market for merchant bars, structurals, and

Wire products were written off to the importers long ago. Recently, Japanese plates have been offered in Houston at prices ranging \$8 to \$9 under domestic mill quotations.

Pig Iron . . .

Pig Iron Prices, Page 194

Business in merchant pig iron continues to coast, with the downtrend expected to extend into the new year. Demand is well below furnace capacity. Foundries are operating on low stocks, largely because of their light order backlogs. That explains the frequent calls on suppliers for rush carloads.

With the holidays approaching, no upswing in business is anticipated until next quarter. and there, though, some encouraging signs can be seen in the market picture. For example, Symington-Gould Div., Symington-Wayne Corp., operating a large foundry in Depew, N. Y., reports improved demand for railroad castings. Foundries making automotive castings are also doing better than they

Youngstown Sheet & Tube Co., Youngstown, will light its Jeannette blast furnace, one of two units at its Brier Hill Works. It is an 800ton furnace, idle since last January.

At the same time Shenango Furnace Co., Sharpsville, Pa., is recalling an additional 100 employees at its ingot mold division.

Iron Ore . . .

Iron Ore Prices, Page 195

Vessel shipments of Lake Superior iron ore in November totaled 4,528,563 gross tons, reports the American Iron Ore Association. In November, 1957, the movement amounted to 4,066,829 tons.

Shipments to the end of November amounted to 52,792,715 tons, off 31.803.658 from the 84,596,373 tons moved in the like period of the 1957 shipping season.

Except for the ports of Escanaba and Michipicoten, figures are final for the season. season movement is the smallest since 1939 when the total was 45,-547.974 tons.

August imports of iron ore for consumption in the U.S. totaled 2,854,056 gross tons valued at \$24,-491,792, reports the Bureau of Mines. Canada supplied 47 per cent, Venezuela 37 per cent, Chile 9 per cent, Peru 3 per cent, Brazil 2 per cent, and Liberia, Mexico, Philippines, and the United Kingdom 2 per cent.

In the first eight months of this year, imports valued at \$148,084,-679 amounted to 17,451,482 gross tons, 18 per cent less than in the like 1957 period. They accounted for about 25 per cent of total domestic supply in the period.

fron Ore Imports* (Gross tons)

		First Eight
Sources: At	igust, 1958	Months 1958
Brazil	43,460	500,380
British W. Africa		29,280
Canada	1,339,013	4,667,669
Chile	264,407	2,177,016
Denmark		98
Dominican Republic		21,000
Iran		2,461
Liberia	31,539	514,581
Mexico	11,272	146,138
Panama		13,856
Peru	98,324	1,254,950
Philippines	9,800	53,851
Sweden		93,984
United Kingdom	129	544
Venezuela	1,056,112	8,065,674
Total	2,854,056	17,541,482

^{*}Exclusive of ore containing 10 per cent or more manganese.

Structural Shapes . . .

Structural Shape Prices, Page 189

Competition among structural fabricators is stronger. Many shops are reaching out for work they normally wouldn't consider (for reasons of size, type of structure, and geographic location). Significantly, 13 fabricators recently bid directly on 1400 tons of Pennsylvania State bridgework in Susquehanna County. Eleven general contractors also bid.

Some of the larger and mediumsized fabricators say their backlogs are still holding up well. shops anticipate an upturn in demand in February.

New England shops have sm backlogs; sharp competition is flected in easing prices. Bridgest count for the bulk of volume in Most are of stringer rolled beam design, requiring minimum of shopwork.

With plain material availa from the mills in about four we (less in some cases), fabricat shops are ordering only to fill

quirements in sight.

Heavy bridge volume is proji ed for the San Francisco area. proposal for a twin span along the San Mateo-Hayward Brill will be introduced in the Californ legislature in January. The po ect would cost about \$25 milli Also considered in long range pll ning is a larger bridge closer San Francisco to complement San Francisco-Oakland Bay spir

STRUCTURAL SHAPES . . . STRUCTURAL STEEL PLACED

1100 tons, foundation work, office build Western Electric Co., Broadway and Fu St., New York, to Dreier Structural 2 Co. Inc., Long Island City, N. Y.; Co. Inc., Long Island City, N. Y.; is in addition to 8500 tons recently repoplaced with this same fabricator for main structure.

900 tons, state bridgework, Fulton Coun Pennsylvania, prestressed concrete des J. Robert Bazley, Pottsville, Pa., gent contractor, one of 15 bidders.

700 tons, maintenance hangar, Scandinar Air Lines, Idlewild Airport, Long Isin N. Y., to the White Plains Iron Work Peekskill, N. Y.

645 tons, hangar, Logan Air Field, Bost to A. O. Wilson Structural Co., Cambrid Mass.; bids direct on steel.

437 tons, Entiat Bridge, Rocky Reach remation project, for Chelan County P.1 No. 1, Wenatchee, Wash, to Bethle Pacific Coast Steel Corp., Seattle; general contract to Snitily Bros. Construction Wenatchee, low at \$506,316.

400 tons, additions to Port of Tacoma greelevator, to Isaacson Iron Works, Seas

bidding \$119,742

bidding \$119, (42.)
250 tons, state highway bridge, Concord, N.
to Bancroft & Martin Rolling Mills
South Portland, Maine; R. G. Wath
Amesbury, Mass., general contractor.
245 tons, St. Vincent's Orphanage, Ph Wath

delphia, to Joyce Steel Fabricators, Ches

215 tons, angles, General Stores Supply Off Navy, Philadelphia, to Southern Galvania Co., Baltimore.

200 tons, plant building, Bird & Son II Norwood, Mass., to A. O. Wilson Structu Co., Cambridge, Mass.; Vappi Construc Boston, general contractor.

Co., Boston, general contractor.
200 tons, five-span stringer bridge, Rehobe Mass., to City Iron Works, Wethersfil Conn.; M. A. Gammino Construction of Providence, R. I., general contractor.
175 tons, WF 60-ft lengths, Navy Purchas Office, Los Angeles, to Columbia-General Steel Div., U. S. Steel Corp., Los Angel 135 tons, Dimmitt School, Renton, Wash., Leckenby Structural Steel Co., Seattle.
120 tons, Bureau of Public Roads, Eagle Cl. Oreg. bridge, to Oregon Iron Works, Pc

Oreg. bridge, to Oregon Iron Works, Po land, Oreg.

125 tons, two-span composite WF beam brid Bethel, Vt., to Bethlehem Steel Co., Beth hem, Pa.; Ralph B. Goodrich Inc., So Burlington, Vt., general contractor; reinfo ing bars, Truscon Steel Div., Republic St Corp., Boston.

110 tons, storage tanks for Fisher Flour Mills Co., Seattle, and grain storage Port of Walla Walla, Wash., at Pas

STRUCTURAL STEEL PENDING

2200 tons, state roadwork, Westchester County. New York, Poirier & McLane Corp. low on the general contract,

40 tons, office building, U. S. Commission to the United Nations, New York, Sovereign Contracting Co., Ft. Lee, N. J., general contractor.

1400 tons, state bridgework, Susquehanna County, Pennsylvania, Lycoming Construc-tion Co., Williamsport, Pa., low on the general contract.

1300 tons, Fresh Pond bus garage, New York City Transit Authority, for erection in the Borough of Queens, bids closed.

76 tons, state bridgework, LR 641/22-A, Beaver County, Pennsylvania, bids to be taken Dec. 30.

tons, state highway bridges Stoneham-Winchester-Woburn, Mass.; bids in.

584 tons, wharf on lower Manhattan for the New York City Marine & Aviation Department; bids closed.

87 tons, state bridgework, Broome County, New York; Harris & Burrows, Jersey City, N. J., awarded the general contract.
60 tons, state bridge, LR 799/1, Franklin County, Pennsylvania, bids to be taken

Dec. 30.

370 tons, approach to Washington State Hood Canal bridge; bids to Olympia, Wash., postpoed to Dec. 16.

295 tons, research center, University of Washington; W. G. Clark Construction Co., Seattle, low at \$389,783.

250 tons, state highway bridge, Andover, Mass.;

105 tons, state highway bridge, Vernon, Conn.; bids Dec. 15, Hartford, Conn.

REINFORCING BARS . . .

REINFORCING BARS PLACED

800 tons, Overlake Catholic School, Issaquah, Wash, to Northwest Steel Rolling Mills Inc., Seattle; J. C. Boespflug Construction Co., Seattle, general contractor, low at \$3,395,847.

313 tons, relocation bridges for P.U.D. No. 1, Wenatchee, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle; Snitily Bros., Wenatchee, has general contract at \$506,316. \$10 tons, Newcombe Hospital, Vineland, N. J.;

to unnamed supplier.

REINFORCING BARS PENDING

2300 tons, Hawthorne Apartments, Philadelphia: pending.

665 tons, state bridgework, Armstrong County, Pennsylvania, bids Dec. 19; also requires 1560 tons of structural steel. 535 tons, state bridgework, Cumberland Coun-

35 tons, state bridgework, Cumberland County, Pennsylvania, bids Dec. 19; project also requires 1947 tons of structural steel.

25 tons, Hanson Dam project near Seattle, also 160 tons of shapes and plates involved; general contract to Henry J. Kalser-Raymong Inc., Oakland, Calif., low at \$8,840,000 to the U. S. Engineer, Seattle.

350 tons, Idaho State highway project, Cassia County, seven bridges and passes; Lonnie E. Smith Construction Co., Twin Falls, Idaho, low at \$520,082.

266 tons, state bridgework, Lackawanna County, Pennsylvania; bids Dec. 19.

tons, also 180 tons of shapes, Washington State, King County bridge and approaches; general contract to Neukirch Bros. and Pu-Sound Construction Co., Seattle, joint

low bidders at \$370.035.

150 tons, addition to Lincoln High School, Seattle; general contract to Lease Co.. Seat-

PLATES . . .

PLATES PLACED

255 tons, hull, General Stores Supply Office, Navy, Philadelphia, to C. Itoh & Co. (American). New York.

100 tons, grade Hy-80, Navy Purchasing Office, Washington, to U. S. Steel Corp., Pittsburgh.

60 tons or more, water storage tank, Overlake Catholic School, near Seattle, to the Chicago Bridge & Iron Co., Seattle.

PLATES PENDING

475 tons, grade Hy-80, Navy Purchasing Of-

fice. Washington, bids to be taken Dec 17. 155 tons, class B, grade 2, Watertown Arsenal, Watertown, Mass.

RAILS, CARS . . .

RAILROAD CARS PLACED

New York Transit Authority, 110 subway cars, to American Car & Foundry Div., ACF Industries, New York; 200 additional cars to be purchased in 1959, subject to approval by the New York City Board of Estimate. Union Pacific, five coaches, to St. Louis Car

Co., St. Louis. Northern Pacific, 400 forty-ft boxcars and 100 fifty-ft insulated boxcars, to its Brainard, Minn., shops; railroad contem-plates purchasing 50 mechanical refrigerator cars from an outside carbuilder.

Distributors . . .

Prices, Page 194

Steel service centers report demand is slowing down as the holiday season nears, though the experience of all sellers is not alike in all districts. In the East, indications are that October and November were the two leading months of the year, valuewise because of higher prices, and tonnagewise because of stronger demand.

In the Southwest, sales are reported picking up. One distributor thinks December volume will match that in October. weather is reflected in continued steady movement of building steel products.

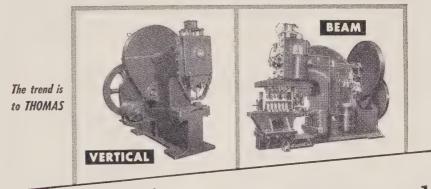
Prices were raised in the Pacific Northwest last week, the new schedule conforming with mill advances effected last summer. Area sellers report business is slightly improved. In the Los Angeles market, volume is reported up 15 per cent over October levels.

Business has been as level as a billiard table in the Chicago market since early October.

Steel shipments by the service centers this year will be down 25 to 30 per cent from 1957's. It's believed 1959 business will make up the 1958 losses. A gain of about 15 per cent is looked for.

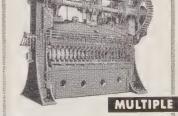
Currently, business is best on the West Coast. Chicago also is another strong area. Weakest area seems to be Cleveland, with the East Coast not far behind.

Most current demand is for flatrolled products, but the movement of other products is fairly uniform, except that structurals are on the light side. Price cutting continues, particularly on the West Coast and in Texas.



has the punch you need THOMAS





A wide range of capacities for any punching need Send for bulletin on type you require

SHEARS • PRESSES • BENDERS • SPACING TABLES



PITTSBURGH 23, PA.

November Zinc Shipments Second Best Since May, '57

Shipments of slab zinc fell a little in November, but it was the second best showing the metal has made since May, 1957—last month was better.

Total shipments, including export and drawback, hit 83,606 tons, compared with October's 93,244 tons.

Stocks tumbled for the fourth straight month and now stand at 191,744 tons. Stocks hit their high in July when they registered 257,-911 tons.

Producers expect high level galvanizing operations and improved demand for diecastings to make December as good a month as November for the zinc industry.

Harvester Labor Trouble Forces More Layoffs

The Milwaukee Works of International Harvester Co. laid off 1150 production and maintenance workers on Dec. 5. The move was made necessary by United Auto Worker strikes at other Harvester plants. Harvester's Milwaukee workers were not on strike.

The union and company met with federal negotiators last week in an effort to end the strike which started Nov. 13 and has idled 36,000 workers. The company made a new proposal for a three-year contract which provides annual pay boosts retroactive to Aug. 23.

A 75-day strike at Kensington Steel Co., Chicago, a steel foundry,

ended when an agreement between the company and its UAW union was reached Dec. 5. Terms provided an 8 cent an hour pay increase for production workers, 16 cents for skilled workers, a 45 cent raise for incentive workers (who will get the 8 cent increase when not on piecework), and a 5 cent raise for maintenance helpers.

The strike involved 260 workers.

November Steel Output Tops Year Ago Mark

November steel ingot production amounted to 8,582,000 tons, or 74.2 per cent of capacity, reports the American Iron & Steel Institute. It compares with a revised figure for October of 8,817,778 tons, or 73.8 per cent of capacity.

The total output for the first 11 months of the year was 76,469,045 tons, vs. 105,294,711 in the like pe-

riod a year ago.

November was the first time this year that output exceeded a year-ago period. Output in November, 1957, was 8,392,919 net tons.

Canada . . .

Canadian steel production has returned to normal following the strike settlement and resumption of operations at the Steel Co. of Canada Ltd.

For the week ended Dec. 1, production of steel ingots rose to 98,-989 tons, or 87.1 per cent of rated capacity. That compares with 98,-066 tons, or 86.2 per cent in the preceding week, and 95,164 tons, or 83.7 per cent of capacity in the week ended Nov. 15.

October Steel Shipments: Largest Since Year Ago

Finished steel shipments during October totaled 6,224,540 net toning reports the American Iron & Steel Institute. That's nearly 16 per center more than the September figure and is the largest monthly toring shipped sice October, 1957 September shipments were 5,3866 292 net tons, and in October, 1957 the total was 6,550,690 tons.

In the first ten months this year shipments amounted to 49,226,077 tons. That's down sharply from the 69,155,531 moved in the corresponding period of 1957.

For the first time this year monthly shipments of cold-rolled sheets exceeded a million tom (1,074,165 tons) in October. Other major product shipments included Electrolytic tin plate (763,361 tons) hot-rolled sheets (687,273 tons) hot-rolled bars, including light shapes (593,804 tons); plates (460, 986 tons).

Shipments to major market were: Warehouses and distributors: 1,113,944 tons; automotive, 1,056, 706; containers, 936,668; construction, including maintenance, 781, 392; contractors' products, 333, 598 tons.

Stainless Steel . . .

Stainless Steel Prices, Page 193

Demand for stainless steel bardshows little change from that at month ago, reports a Detroit area seller. Flat-rolled stainless orders, however, are increasing.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

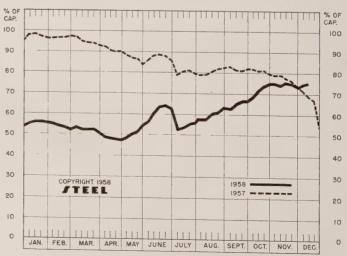
	~		J D /	
	k Ended		Same	
D	ec. 14	Change	1957	1956
Pittsburgh	72	+ 5*	67	102.5
Chicago	85.5	+ 0.5*	75	101
Eastern	71	0	81	102
Youngstown	60	0	65	104
Wheeling	83.5	+ 0.5	61.5	100
Cleveland	73.5	+ 3.5*	68	104.5
	68.5	+ 2.5	63.5	107.5
	65	+ 2.5	67	94
Cincinnati	86	+ 4.5	72.5	93.5
	94	+ 6*	60.5	95.5
	97	- 3	91.5	103.5
Western	79	— i	80	103
National Rate	75.5	+ 1	69	102

INGOT PRODUCTION#

	Veek Ended Dec. 14	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)		123.6	125.2	110.2
NET TONS	. 2,015	1,985	2,011	1,770

*Change from preceding week's revised rate, †Estimated, ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,699,173 in 1958; 2,559,490 in 1957; 2,461,893 in 1956.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics) 190 (1947-49=100) 180 170 160 1958 - By Weeks 150 140 130 120 1952 1954 JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT OCT. NOV DEC. 1953 1955 Dec. 9, 1958 Week Ago Month Ago Nov. Avg Year Ago

186.7

ERAGE PRICES OF STEEL (Bureau of Labor Statistics)

187.4

Week Ended Dec. 9

187.4

ces include mill base prices and typical extras and deductions. Units 100 lb except where otherwise noted in parentheses. For complete ceription of the following products and extras and deductions appeared to them, write to Stema.

	,			
i	ils, Standard No. 1	\$5.825	Bars, Reinforcing	6.385
	ils, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
	Plates	6.875	Bars, C.F., Alloy	14.125
	les, Railway	10.175	Bars, C.F., Stainless, 302	
		10.110		0.553
	ieels, Freight Car, 33		(lb)	
	n. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
	ates, Carbon	6.350	Sheets, C.R., Carbon	7.300
	uctural Shapes	6.167	Sheets, Galvanized	8.695
			Sheets, C.R., Stainless, 302	
	rs, Tool Steel, Carbon	0 = 00	(lb)	0.688
	(lb)	0.560	Sheets, Electrical	12.625
	rs, Tool Steel, Alloy, Oil		Strip, C.R., Carbon	9,489
t	Hardening Die (lb)	0.680	Strip, C.R., Stainless, 430	
	rs. Tool Steel, H.R.,		(lb)	0.493
	Alloy, High Speed, W			6.250
	8.75, Cr 4.5, V 2.1, Mo		Strip, H.R., Carbon	0.200
		1.400	Pipe, Black, Buttweld (100	00 505
	5.5, C 0.060 (lb)	1.400	ft)	20.525
	rs, Tool Steel, H.R.,		Pipe, Galv., Buttweld (100	
ı	Alloy, High Speed, W18,		ft)	24.315
	Cr 4, V 1 (lb)	1.895	Pipe, Line (100 ft)	205.710
	urs, H.R., Alloy	10.775	Casing, Oil Well, Carbon	
	urs. H.R., Stainless, 303	_0.110	(100 ft)	201,080
		0.525	Casing, Oil Well, Alloy	
	(lb)		(100 ft)	315 213
	urs, H.R., Carbon	6.675	(100 1t)	010.210

	bon (100 ft) 26.157 Wire, Drawn, Carbon	box) 7.900 n 10.57
--	---	-----------------------

181.7

STEEL'S FINISHED STEEL PRICE INDEX*

187.4

	Dec. 10	Week	Month	Year	5 Yr
	1958	Ago	Ago	Ago	Ago
Index (1935-39 avg=100) Index in cents per lb		247.82 6.713	247.82 6.713	239.15 6.479	189.74 5.140

STEEL'S ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	\$149,96	\$149.96	\$149.96	\$146.03	\$114.64
No. 2 Fdry Pig Iron, GT		66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	39.17	39.67	42.33	32.00	33.00

^{*}For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Ago

\$67.00

66.00

70.41

66.50

66.50

70.91

62.50

70.20

66.50

66.50

30.50

Ago \$67.00

66.00

70.41

66.50

66.50

70.91

62.50

70.20

66.50

66.50

30.50

30.50

Dec. 10 1958

70.41

66.50

70.91

62.50

Comparison of Prices

PIG IRON, Gross Ton

Basic, deld., Phila.

No. 2 Fdry, Chicago

No. 2 Fdry, deld., Phila. ..

No. 2 Fdry, Birm,

COKE, Net Ton

Bessemer, Pitts. \$67.00

Basic, Valley 66.00

No. 2 Fdry, NevilleIsland, Pa. 66.50

No. 2 Fdry (Birm.) deld. Cin. 70.20

Malleable, Valley 66.50

Malleable, Chicaago 66.50

Beehive, Furn., Connisvi. . . \$15.25 Beehive, Fdry., Connisvi. . . 18.25 Oven, Fdry., Milwaukee . . . 30.50

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

	Dec. 10	Week	Month	Year	5 Yr
INISHED STEEL	1958	Ago	Ago	Ago	Ago
				= .0=	4 15
irs, H.R., Pittsburgh		5.675	5.675	5.425	4.15 4.15
ars, H.R., Chicago		5.675	5.675 5.975	5.425 5.725	5.302
ars, H.R., deld. Philadelphia		5.975 7.65°	7.65	7.30*	5.20
ars, C.F., Pittsburgh				5.275	4.10
apes, Std., Pittsburgh		5.50 5.50	5.50 5.50	5.275	4.10
napes, Std., Chicago		5.77	5.77	5.545	4.38
napes, deld., Philadelphia		5.20	5.30	5.10	4.10
lates, Pittsburgh		5.30	5.30	5.10	4.10
lates, Chicago		5.30	5.30	5.10	4.35
lates. Sparrows Point, Md		5.30	5.30	5.10	4.10
lates, Claymont, Del		5.30	5.30	5.70	4.55
		5.10	5.10	4.925	3.925
heets, H.R., Pittsburgh		5.10	5.10	4.925	3.925
heets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
heets. C.R., Chicago	. 6.275	6.275	6.275	6.05	4.775
heets. C.R., Detroit		6.275	6.275	6.05-6.15	5 4.975 5.275
heets, Galv., Pittsburgh .	. 6.875	6.875	6.875		
trip, H.R., Pittsburgh	. 5.10	5.10	5.10	4.925	4.425 3.925
trip. H.R., Chicago	. 5.10	5.10	5.10	4.925 7.15	5.45
trip, C.R., Pittsburgh	. 7.425	7.425	7.425 7.425	7.15	5.70
trip, C.R., Chicago		7.425 7.425	7.425		5.45-6.05
trip, C.R., Detroit			8.00	7.65	5.525
Vire, Basic, Pittsburgh		8.00			6.55
lails, Wire, Pittsburgh	. 8.95	8.95	8.95	8.95 \$10.30	\$8.95
in plate (1.50 lb) box, Pitts.	\$10.65	\$10.65	\$10.65	\$10.50	40.00
1		+==			
*Including 0.35c for spec	nai quan	v.y.,			

Ferromanganese, net tont 245		245.00	245.00	200.00
SCRAP, Gross Ton (Includ	ing broker's	commi	ssion)	
No. 1 Heavy Melt, Pittsburgh \$41	1.50 \$41.50	\$44.50	\$31.50	\$33.50
	1.00 35.00	40.00	33.50	33.00
	2.00 42.50	42.50	31.00	32.50
	2.50 42.50	43.50	29.50	32.50
	9.00 39.00	40.00	26.50	30.50
	3.50 33.50	35.50	31.50	32.50
	3,50 63.50	62.00	47.50	46.50
Rails, iteroning, omosge	5.50 45.50	45.50	35.50	33.50

BEMIFINISHED STEEL

Wire rods 73-5%" Pitts. (NT). \$99.50 \$75.50 6.40 6.40 6.15

\$14.75 16.75 25.25

Ago

\$67.00

66.00

70.01

66.50

66.50

70.51

62.50

70.20

66.50

66.50

\$57.00

56.00

60.75

56.50

56.50

61.25

52.88

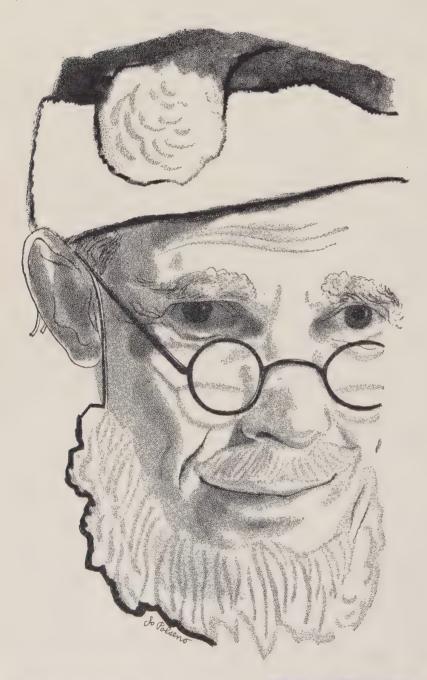
60.43

56.50

56.50

We took a sage suggestion from Santa





"This Christmas check is wonderft our office Santa Claus told us last you while he was making up for the office party. "But you should have encloss an application card for more U.S. So ings Bonds on our Payroll Saving Plan. The time to persuade me to vest money is when I have money."

That was such a sound idea that the year all our Christmas checks to exployees will be accompanied by a Paroll Savings card and the suggestion that the recipient sign up immediate for the regular purchase of U.S. Savings Bonds through the coming year

Experience shows that whenever company makes it easy for employed to set up sound savings plans, peop welcome this opportunity. Today these are more payroll savers than ever he fore in peace time. For helpful surgestions and the newest information folders and leaflets, call your State Savings Bonds Director. You'll find his listed in the phone book. Or writt Savings Bonds Division, U.S. Treasur Dept., Washington, D. C.







teel Prices Mill Code	prics as reportd to STEEL, number following mill point	Dec. 10, cents per pound exts indicates producing companies	ccept as otherwise noted. Cony. Key to producers, page	Changes show in italics. 190, footnotes, page 192.
SEMIFINISHED GOIS, Carbon, Forging (NI) unball, Pa. U5 \$76.00 GOIS, Alloy (NI) stroit \$41 \$82.00 conomy, Pa. B14 82.00 larrell, Pa. S3 82.00 larrell, Pa. C18 82.00 unball, Pa. C18 82.00 unball, Pa. U5 82.00 daron, Pa. 83 82.00 LETS, BLOOMS & SLABS	LosAngeles B3	Bessemer, Ala. T2 5.30 Clairton, Pa. U5 5.30 Claymont, Del. C22 5.30 Cleveland J5, R2 5.30 Coatesville, Pa. L7 5.30 Coatesville, Pa. L7 5.30 Ecorse, Mich. G5 5.30 Fairfield, Ala. T2 5.30 Fortana, Calif. (30) K1 6.10 Gary, Ind. U5 5.30 Geneva, Utah C11 5.30 Geneva, Utah C11 5.30 GraniteCity, Ill. G4 5.40 Harrisburg, Pa. P4 5.30	Bessemer, Ala. (9) T2 . 5.675 Birmingham (9) C15 . 5.675 Buffalo (9) R2 . 5.675 Canton, O. (23) R2 . 6.15 Clairton, Pa. (9) U5 . 5.675 Cleveland (9) R2 . 5.675 Cleveland (9) R5 . 5.675 Emeryville, Calif. J7 . 6.425 Fairfield, Ala. (9) T2 . 5.676 Fairless, Pa. (9) U5 . 5.825 Fontana, Calif. (9) K1 . 6.375 Gary, Ind. (9) U5 . 5.676 Houston (9) S5 . 5.925 Hod, Harbor (9) 1-2, Y1, 5.675	Niles, Calif. P1
Carbon, Rerolling (NT) rtonville, Ill. K4	STRUCTURALS Carbon Steel Std. Shapes AlabamaCity, Ala. R2 5.50 Aliquippa, Pa. J5 5.50 Allquippa, Pa. J5 5.50 Atlanta A11 5.70 Bessemer, Ala. T2 5.50 Birmingham C15 5.50 Clairton, Pa. U5 5.50 Clairton, Pa. U5 5.50 Fairfield, Ala. T2 5.50 Fontana, Calif. K1 6.30 Gary, Ind. U5 5.50 Geneva, Utah C11 5.50 Houston S5 5.60 Ind. Harbor, Ind. I-2, Y1.5.50 5.60 Johnstown, Pa. B2 5.55	Houston S5	Johnstown, Pa. (9) B2 . 5.675 Joliet, Ill. P22 . 5.675 KansasCity, Mo. (9) S5 . 5.925 Lackawanna (9) B2 . 5.676 LosAngeles (9) B3 . 6.376 Massillon, O. (23) R2 . 6.15 Midland, Pa. (23) C13 . 6.025 Milton, Pa. M18 . 5.825 Minnequa, Colo. C10 . 6.125 Niles, Calif. P1 . 6.375 N.T'wan'a, N. Y. (28) B11 6.025 Owensboro, Ky. (9) G8 . 6.025 Pittsburg, Calif. (9) C11. 6.375 Pittsburgh (9) J5 . 5.675 Portland, Oreg. O4 . 6.425 Riverdale, Ill. (9) A1 . 5.675	BARS, C.F. Leaded (Including leaded extra) Carbon LosAngeles P2, S30 .11.75* Alloy Ambridge, Pa. W18 .10.175 BeaverFalls, Pa. M12 .10.175 Camden, N.J. P13 .10.35 Chicago W18 .10.175 Blyria, O. W3 .10.175 Monaca, Pa. S17 .10.175 Nowark, N.J. W18 .10.35 SpringCity, Pa. K3 .10.35
Carbon, Forging (NT) "Segmer.Pa. U5 . \$99.50 iffalo R2	Joliet. III. P22 5.50 KansasCity. Mo. 85 5.60 Lackawanna. N.Y. B2 5.55 LosAngeles B3 6.20 Minnequa, Colo. C10 5.80 Munhall. Pa. U5 5.50 Niles. Calif. P1 6.25 Phoenixville, Pa. P4 5.55 Portland. Oreg. O4 6.25 Seattle B3 6.25 S. Chicago, III. U5, W14 5.50 S. SanFrancisco B3 6.15 Sterling. III. N15 5.50 Torrance. Calif. C11 6.20 Weirton, W.Va. W6 5.50	Warren.O. R2 . 5.30 Youngstown U5, Y1 . 5.30 Youngstown (27) R2 . 5.30 PLATES, Carbon Abras. Resist. Claymont.Del. C22 . 6.75 Fontana, Calif. K1 . 7.85 Geneva, Utah C11 . 7.05 Houston S5 7.15 Johnstown.Pa. B2 . 7.05 SparrowsPoint.Md. B2 . 7.05 PLATES, Wrought Iron Economy, Pa. B14 13.55 PLATES, H.S., L.A.	Seattle B3, N14	*Grade A; add 0.050c for Grade B. BARS, Cold-Finished Corbon Ambridge, Pa. W18 7.65 BeaverFalls, Pa. M12, R2. 7.65 Birmingham C15 . 8.25 Buffalo B5 7.70 Camden, N. J. P13 . 8.10 Carnegie, Pa. C12 . 7.65 Chicago W18 7.65 Cleveland A7, C20 . 7.65 Detroit B5, P17 . 7.85 Detroit S41 . 7.65 Donora, Pa. A7 . 7.65
ckawanna, N. Y. B2. 99.50 skangeles B3. 109.00 idland, Pa. C18. 99.50 inhall, Pa. U5. 99.50 vensboro, Ky. G8. 99.50 attle B3. 113.00 laron, Pa. B3. 99.50 Chicago R2, U5, W14.99.50 Duquesne, Pa. U5. 99.50 San Francisco B3. 109.00 arren, O. C17. 99.50 Alloy, Forging (NT) thlehem, Pa. B2. \$119.00 idgeport, Conn. C32. 119.00	Wide Florge	Aliquippa, Pa. J5 7.95 Ashland, Ky. A10 7.95 Bessemer, Ala. T2 7.95 Clairton, Pa. U5 7.95 Claymont, Del. C22 7.95 Cleveland J5, R2 7.95 Coatesville, Pa. L7 7.95 Conshohocken, Pa. A3 7.95 Economy, Pa. B14 7.95 Econse, Mich. G5 7.95 Fairfield, Ala. T2 7.95 Farrell, Pa. S3 7.95 Fontana, Calift, (30) K1 8.75 Genvy, Id. U5 7.95 Geneva, Utah C11 7.95 Geneva, Utah C11 7.95	Bridgeport, Conn. C32 6.80 Buffalo R2 6.725 Canton, O. R2, T7 6.725 Clairton, Pa. U5 6.725 Detroit 841 6.725 Economy, Pa. B14 6.725 Ecorse, Mich. G5 6.725 Fairless, Pa. U5 6.876 Farrell, Pa. S3 6.726 Fontana, Calif. K1 7.775 Gary, Ind. U5 6.725 Houston 85 6.976 Ind. Harbor, Ind. I-2, Y1. 6.725 KansasCity, Mo. 85 6.976 KansasCity, Mo. 85 6.977	Elyria, O. W8 7.65 FranklinPark, III. N5 7.65 Grav, Ind. R2 7.65 GreenBay, Wis. F7 7.65 GreenBay, Wis. F7 7.65 Hammond, Ind. J5, L2 7.65 Hartford, Conn. R2 8.15 Hartvey, III. B5 7.65 LosAngeles (49) 830 9.10 LosAngeles (49) P2, R2 9.10 Mensfield, Mass. B2 8.20 Massillon, O. R2, R8 7.65 Midland, Pa. C18 7.65 Monaca, Pa. S17 7.65 NewCastle, Pa. (17) B4 7.65 NewCastle, Pa. (17) B4 7.65
Iffalo R2	Houston S5 6.90 Munhall.Pa. U5 6.80 S.Chicago,Ill. U5, W14 6.80 H.S., I.A. Std. Shapes Aliquippa,Pa. J5 8.05 Bessemer.Ala. T2 8.05 Bethlehem,Pa. B2 8.10 Clairton,Pa. U5 8.05 Fairfield,Ala. T2 8.05 Fontana,Calif. K1 8.85 Gary,Ind. U5 8.05 Geneva,Utah C11 8.05 Houston S5 8.15 Ind.Harbor,Ind. I-2, Y1.8.05	Houston S5	Lackawanna, N. Y. B2 6.725 LosAngeles B3 . 7.775 Loweliville, O. 83 6.725 Massillon, O. R2 6.725 Midland, Pa. C18 6.725 Owensbero, Ky. G8 6.725 Pittsburgh J5 6.725 Sharon, Pa. S3 6.725 Sharon, Pa. S3 6.725 S. Duquesne, Pa. U5 6.725 Struthers, O. Y1 6.725 Youngstown U5 6.725 Youngstown U5 6.725	Pittsburgh J5 . 7.65 Plymouth, Mich. P5 . 7.90 Putman, Conn. W18 . 8.20 Readville, Mass. C14 . 8.20 S. Chicago, Ill. W14 . 7.65 SpringCity, Pa. K3 . 8.10 Struthers, O. Y1 . 7.65 Warren, O. C17 . 7.65 Walkegan, Ill. A7 . 7.65 WillimanticConn. J5 . 8.15 Youngstown F3, Y1 . 7.65 BARS, Cold-Finished Carbon (Turned and Ground) CumberlandMd. (5). C19 6.55
Assillon.O. R2	Johnstown, Pa. B2 8.15 KansasCity, Mo. S5 8.15 Lackawanna, N.Y. B2 8.10 LosAngeles B3 8.75 Munhall, Pa. U5 8.05 Seattle B3 8.80 S.Chicago, Ill. U5, W14 8.05 S.SanFrancisco B3 8.70 Struthers, O. Y1 8.05 H.S., L.A. Wide Flonge Bethlehem, Pa. B2 8.10 Ind. Harbor, Ind. I-2 8.05 Lackawanna, N.Y. B2 8.10 Munhall Pa. U5 8.05	Coatesville.Pa. L17 7.50 Economy.Pa. B14 7.50 Fornell.Pa. 83 7.50 Fontana,Calif. K1 8.30 Gary.Ind. U5 7.50 Houston 85 7.60 Ind. Harbor.Ind. Y1 7.50 Johnstown.Pa. B2 7.50 Lowellville.O. 83 7.50 Munhall.Pa. U5 7.50 Newport.Ky. A2 7.50 Pittsburgh J5 7.50 Seattle B3 8.40 Sharon.Pa. 83 7.50 S.Chicago.Ill. U5, W14 7.50 SparrowsPoint.Md. B2 7.50	High-Strength, Low-Alloy Aliquippa, Pa. J5 8.30 Bessemer, Ala. T2 8.30 Bethlehem, Pa. B2 8.30 Clairton, Pa. U5 8.30 Cleveland R2 8.30 Ecorse, Mich. G5 8.30 Fontana, Calif. K1 9.00 Gary, Ind. U5 8.30 Houston S5 8.35 Ind. Harbor, Ind. Y1 8.30 Johnstown, Pa. B2 8.30 KansasCity, Mo. S5 8.55 Lackawanna, N.Y. B2 8.30	BARS, Cold-Finished Alloy Ambridge, Pa. W18 9.025 BeaverFalls, Pa. M12, R2 9.025 Bethlehem, Pa. B2 9.025 Bridgeport, Conn. C32 9.175 Buffalo B5 9.025 Camden, N.J. P13 9.20 Canton, O. T7 9.20 Carnegie, Pa. C12 9.025 Chicago W18 9.025 Cleveland A7, C20 9.025 Detroit B5, P17 9.25 Detroit B5, P17 9.25 Donora, Pa. A7 9.025
Duquesne, Pa. U5 122.50 arren, O. C17 122.50 EIP liquippa, Pa. J5 .5.05 unhall, Pa. U5 5.05 ttsburgh J5 5.05 arren, O. R2 5.05 oungstown R2, U5 5.05 labamaCity, Ala. R2 6.40 liquippa, Pa. J5 6.40 tton, Ill. L1 6.60	BEARING PILES Bethlehem. Pa. B2	Youngstown Y1	LosAngeles B3 9.00 Pittsburgh J5 8.30 Seattle B3 9.05 S.Chicago, Ill. R2, W14 8.30 S.Duquesne,Pa. U5 8.30 S.SanFrancisco B3 9.05 Struthers.O. Y1 8.30 Youngstown U5 8.30 BAR SIZE ANGLES; H.R. Carbon Bethlehem,Pa. (9) B2 5.825 Houston (9) S5 5.925	Elyria, 0. W8 9.025 FranklinPark, III. N5 9.025 Gray, Ind. R2 9.025 GreenBay, Wis. F7 9.025 Hammond, Ind. J5, L2 9.025 Hartford, Conn. R2 9.325 Hartvey, III. B5 9.025 Lackawanna, N. Y. B2 9.025 LosAngeles P2, S30 11.00 Mansfield, Mass. B5 9.325 Massillon, O. R2, R8 9.025 Midland, Pa. C18 9.025 Midland, Pa. C18 9.025 Monaca, Pa. S17 9.025
artonville, III. K4 .6.50 uffalo W12 .6.40 leveland A7 .6.40 onora, Pa. A7 .6.40 airfield, Ala. T2 .6.40 ouston S5 .6.65 adiana Harbor, Ind. Y1.6.40 bliet, III. A7 .6.40 bliet, III. A7 .6.40	Lackawanna, N. Y. B2 0.50 Munhall, Pa. U5 650 S. Chicago, Ill. I-2, U5 6.50 Weirton, W. Va. W6 6.50 PLATES PLATES PLATES PLAIES, Corbon Steel AlabamaCity, Ala. R2 5.30 Aliquippa, Pa. J5 5.30 Ashland, Ky. (15) A10 5.30 Atlanta A11 5.50	Cleveland c.l. R26.05 Warren,O. c.l. R26.05 BARS BARS, Hot-Rolled Carbon (Merchant Quality) Ala,City,Ala.(9) R25.675 Aliquippa, Pa.(9) J55.675 Alton III L15.875	KansasCity, Mo. (9) S5 . 5.925 Lackawana (9) B2 . 5.675 Sterling, Ill. N15 . 5.775 Sterling, Ill. (1) N15 . 5.675 Tonawanda, N.Y. B12 . 5.675 BAR SIZE ANGLES: S. Shapes Aliquippa, Pa. J5 . 5.675 Atlanta A11 5.875 Joliet, Ill. P22 5.675 Minnequa, Colo. C10 . 6.125	Newark, N. J. W18 9,20 Plymouth, Mich. P5 9,225 S. Chicago, Ill. W14 9,025 SpringCity, Pa. K3 9,20 Struthers, O. Y1 9,025 Warren, O. C17 9,025 Warkegan, Ill. A7 9,025 Willimantic. Coun. J5 9,325 Youngstown F3, Y1 9,025

					-
	BARS, Reinforcing, Billet (To Fabricators)	BARS, Rail Steel ChicagoHts.(3) C2, I-2.5.575	SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy	SHEETS, Cold-Rolled, High-Strength, Low-Alloy	SHEETS, Well Casing Fontana, Calif. K1
	AlabamaCity, Ala. R2 5.675 Atlanta Al1 5.675	Object TTA (A) (AA) TO E CTE	ASHIANG, KV. ALU	Aliquippa, Pa. J59.275	SHEETS, Galvanized High-Strength, Low-Alloy
	Birmingham C155.675 Buffalo R25.675 Cleveland R2	Franklin, Pa. (3) F55.575 Franklin, Pa. (4) F55.875	Cleveland J5, R27.525 Conshohocken, Pa. A37.575	Cleveland J5, R29.275 Ecorse, Mich. G59.275 Fairless, Pa. U59.325	Irvin.Pa. U5
	Cleveland R25.675 Ecorse, Mich. G55.675 Emeryville, Calif. J76.425	JerseyShore, Pa. (3) J8 5.55 Marion, O. (3) P11 5.575	Ecorse, Mich. G57.525 Fairfield, Ala. T27.525	Fairless, Pa. U59.325 Fontana, Calif. K110.40 Gary, Ind. U59.275	SparrowsPt. (39) B2 Pittsburgh J5
	Fairfield, Ala. T25.675 Fairless, Pa. U55.825	Tonawanda(3) B125.575 Tonawanda(4) B126.10	Fairless, Pa. U57.575 Farrell, Pa. S37.525 Fontana, Calif. K18.25	Ind.Harbor,Ind. I-2, Y1.9.275 Irvin,Pa. U59.275	SHEETS, Galvannealed Stee
	Fontana, Calif. K16.375 Ft. Worth, Tex. (4) (26) T4 6.125		Gary, Ind. U57.525 Ind. Harbor, Ind. I-2, Y1.7.525	Lackawanna (37) B29.275 Pittsburgh J59.275	Canton, O. R2
	Gary, Ind. U55.675 Houston S55.925	SHEETS	Irvin, Pa. U57.525 Lackawanna (35) B27.525	SparrowsPoint(38) B29.275 Warren, O. R29.275	SHEETS, Galvanized Ingot
	Ind. Harbor, Ind. I-2, Y1 5.675 Johnstown, Pa. B2 5.675	SHEETS, Hot-Rolled Steel (18 Gage and Heavier)	Munhall, Pa. U57.525 Niles, O. S37.525	Weirton, W. Va. W69.275 Youngstown Y19.275	(Hot-Dipped Continuous)
	Joliet, Ill. P225.675 Kansas City, Mo. S55.925	AlabamaCity, Ala. R25.10 Allenport, Pa. P75.10	Pittsburgh J5 7.525 S.Chicago, Ill. U5 , W14.7.525		Ashland, Ky. A10 Middletown, O. A10
	Kokomo, Ind. C165.775 Lackawanna, N.Y. B25.675	Aliquippa, Pa. J55.10 Ashland, Ky. (8) A105.10	SparrowsPoint(36) B27.525	SHEETS, Culvert Cu Cu Steel Fe	SHEETS, Electrogalvanized
	Los Angeles B36.375 Madison, Ill. L15.875 Milton, Pa. M185.825	Cleveland J5, R25.10 Conshohocken, Pa. A35.15	Weirton, W. Va. W6 7.525	Ala.City, Ala. R2.7.225 Ashland, Ky. A10.7.225 7.475	Cleveland (28) R2 Niles, O. (28) R2 Youngstown J5
	Minnequa, Colo. C10 . 6.125 Niles, Calif. P1 6.375	Detroit(8) M15.10 Ecorse, Mich. G55.10	Youngstown U5, Y17.525 SHEETS, Hot-Rolled Ingot Iron	Canton, O. R2 7.225 7.75 Fairfield T2 7.225 7.475	Weirton, W. Va. W6
	Pittsburgh J55.675	Fairfield, Ala. T25.10 Fairless, Pa. U55.15 Farrell, Pa. S35.10	(18 Gage and Heavier) Ashland, Ky. (8) A105.35	Gary, Ind. U5 7.225 7.475 Granite City, Ill. G4 7.325	SHEETS, Aluminum Coatedb Butler, Pa. A10 (type 1)
	SandSprings Okla S5 5 925	Fontana, Calif. K15.825	Cleveland R25.875 Warren, O. R25.875	Ind. Harbor I-2 7.225 7.475 Irvin, Pa. U5 7.225 7.475	Butler, Pa. A10 (type 2)
	Seattle B3, N14 6.425 S.Chicago, Ill. R2, W14.5.675 S.Duquesne, Pa. U5 5.675	Geneva, Utah C115.20 Granite City, Ill. (8) G45.20	Cleveland R27.05	MartinsFry. W10.7.225 7.475	SHEETS, Enameling Iron
	S.SanFrancisco B36.425 SparrowsPoint, Md. B2 5.675	Irvin, Pa. U55.10	Middletown, O. A106.775 Warren, O. R27.05	Pitts., Calif. C117.975 SparrowsPt. B27.225 Pittsburgh J57.225	Ashland, Ky. A10
	Sterling, Ill. (1) N15 5.675 Sterling, Ill. N15 5.775	Mansfield, O. E65.10	SHEETS, Cold-Rolled Steel (Commercial Quality)	Pittsburgh J57.225	Fairfield, Ala. T2 Gary, Ind. U5 Granite City, Ill. G4
	Tonawanda, N.Y. B12 6 10		AlabamaCity, Ala. R26.275 Allenport, Pa. P76.275	SHEETS, Culvert—Pure Iron Ind.Harbor,Ind. I-27.475	Ind. Harbor, Ind. I-2, Y1 Irvin. Pa. U5
	Torrance, Calif. C11 6.375 Youngstown R2, U5 5.675	Pittsburg, Calif. C115.80	Aliquippa, Pa. J56.275 Cleveland J5, R26.275	Ind. Hat Dor, Hu. 1-2 1.410	Middletown, O. A10
	BARS, Reinforcing, Billet	Portsmouth, O. P125.10 Riverdale, Ill. A15.10	Conshohocken, Pa. A3 6.325 Detroit M1	SHEETS, Galvanized Steel Hot-Dipped`	Youngstown Y1
	Boston B2. IIR 0.18	Sharon, Pa. S35.10 S. Chicago, Ill. U5, W145.10	Ecorse, Mich. G56.275 Fairfield, Ala. T26.275	AlabamaCity, Ala. R2 .6.875‡	BLUED STOCK, 29 Gage Dover, O. E6
	Cleveland US7.41	Steubenville, O. W105.10	Fairless, Pa. U56.325 Follansbee, W. Va. F46.275	Ashland, Ky. A106.875† Canton, O. R26.875‡	Follansbee, W. Va. F4 Ind. Harbor, Ind. I-2
	Johnstown Pa. R2 7 22	Weirton, W. Va. W65.10	Fontana, Calif. K17.40 Gary, Ind. U56.275 Granita City, III C46.275	Dover, O. E6	Mansfield, O. E6
	KansasCity, Mo. S5 7.60 Lackawanna, N.Y. B2 . 7.35 Marion, O. P11 6.70	roungstown U5, Y15.10	GraniteCity, Ill. G46.375 Ind. Harbor, Ind. I-2, Y1.6.275 Irvin, Pa. U56.275	Gary, Ind. U56.875† GraniteCity, Ill. G46.975* Ind. Harbor, Ind. I-26.875†	Yorkville, O. W10
	Philadelphia 118	SHEETS, H.R. (19 Ga. & Lighter)	Lackawanna, N.Y. B26.275 Mansfield, O. E66.275	Irvin, Pa. U56.875† Kokomo, Ind. C166.975‡	SHEETS, Long Terne, Steel (Commercial Quality)
	SandSprings Oklo 95 7.00	Niles.O. M21, S36.275	Middletown, O. A10 6.275 Newport, Ky. A2 6.275	MartinsFerry, O. W10 .6.875* Middletown, O. A106.875†	BeechBottom, W. Va. W10 Gary, Ind. U5
	SparrowsPt Md P2 7.22	SHEETS, H.R. Allov	Pittsburg, Calif. C117.225 Pittsburgh J56.275	Pittsburg, Calif. C117.625* Pittsburgh J56.875†	Mansfield, O. E6 Middletown, O. A10
	St. Paul U8	Gary, Ind. U58.40	Portsmouth, O. P126.275 SparrowsPoint, Md. B26.275	SparrowsPt.,Md. B26.875† Warren,O. R26.875†	Niles, O. M21, S3
	BARS, Wrought Iron Economy Pa (S.R.) R14 14 00	Irvin, Pa. U58.40	Steubenville, O. W10 .6.275 Warren, O. R2 6.275 Welrton, W. Va. W6 6.275	Weirton, W. Va. W66.875*	Weirton, W. Va. W6
			Yorkville, O. W10	*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.	SHEETS, Long Terne, Ingot Middletown, O. A10
			-Key To Producers-		
	A1 Acme Steel Co. A2 Acme-Newport Steel Co. A3 Alan Wood Steel Co.	C23 Charter Wire Inc. C24 G. O. Carlson Inc.	J6 Joslyn Mfg. & Supply J7 Judson Steel Corp.	P4 Phoenix Iron & Steel Co., Sub. of Barium Steel	S41 Stainless & Strip D'
	A3 Alan Wood Steel Co. A4 Allegheny Ludlum Steel A5 Alloy Metal Wire Div.,	C32 Carpenter Steel of N. Eng.	J8 Jersey Shore Steel Co.	Corp. P5 Pilgrim Drawn Steel	S42 Southern Elec. Steel
	H. K. Porter Co. Inc. A6 American Shim Steel Co.	D2 Detroit Steel Corp. D4 Disston Div., H. K. Porter Co. Inc.	K1 Kaiser Steel Corp. K2 Keokuk Electro-Metals	P6 Pittsburgh Coke & Chem. P7 Pittsburgh Steel Co.	T2 Tenn. Coal & Iron Di U. S. Steel Corp.
	A7 American Steel & Wire Div., U. S. Steel Corn	D6 Driver-Harris Co. D7 Dickson Weatherproof	K3 Keystone Drawn Steel K4 Keystone Steel & Wire	P11 Pollak Steel Co. P12 Portsmouth Div.,	T3 Tenn. Products & Chaical Corp.
	An Anchor Drawn Steel Co. An Angell Nail & Charlet	Nail Co. D8 Damascus Tube Co.	K7 Kenmore Metals Corp. L1 Laclede Steel Co.	Detroit Steel Corp. P13 Precision Drawn Steel P14 Pitts. Screw & Bolt Co.	T4 Texas Steel Co. T5 Thomas Strip Div.,
	A10 Armco Steel Corp. A11 Atlantic Steel Co.	D9 Wilbur B. Driver Co.	L2 LaSalle Steel Co. L3 Latrobe Steel Co.	P15 Pittsburgh Metallurgical P16 Page Steel & Wire Div.,	Pittsburgh Steel Co. To Thompson Wire Co. Trimken Roller Bearing
	B1 Babcock & Wilcox Co.	E1 Eastern Gas&Fuel Assoc. E2 Eastern Stainless Steel	L6 Lone Star Steel Co. L7 Lukens Steel Co.	American Chain & Cable P17 Plymouth Steel Corp.	T7 Timken Roller Bearing T9 Tonawanda Iron Diversity Am.Rad, & Stan. Sea
	B2 Bethlehem Steel Co. B3 Beth. Pac. Coast Steel B4 Blair Strip Steel Co.	E4 Electro Metallurgical Co. E5 Elliott Bros. Steel Co.	L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.	P19 Pitts. Rolling Mills P20 Prod. Steel Strip Corp	T13 Tube Methods Inc. T19 Techalloy Co. Inc.
	B5 Bliss & Laughlin Inc. B8 Braeburn Alloy Steel	E6 Empire-Reeves Steel Corp.	M1 McLouth Steel Corp.	P22 Phoenix Mfg. Co. P24 Phil. Steel & Wire Corp.	U3 Union Wire Rope Com
	Sharon Steel Corn	E10 Enamel Prod. & Plating	M4 Mahoning Valley Steel M6 Mercer Pipe Div., Saw-	R2 Republic Steel Corp.	U4 Universal-Cyclops Stat U5 United States Steel C
	B10 E. & G. Brooke, Wick- wire Spencer Steel Div.,	F2 Firth Sterling Inc. F3 Fitzsimmons Steel Co. F4 Follanshee Steel Corp.	hill Tubular Products M8 Mid-States Steel & Wire M12 Moltrup Steel Products	R3 Rhode Island Steel Corp. R5 Roebling's Sons, John A.	U6 U. S. Pipe & Foundry U7 Ulbrich Stainless Ste
	Colo. Fuel & Iron B11 Buffalo Bolt Co., Div.	F4 Follansbee Steel Corp. F5 Franklin Steel Div., Borg-Warner Corp.	M14 McInnes Steel Co. M16 Md. Fine & Special Wire	R6 Rome Strip Steel Co. R8 Reliance Div., Eaton Mfg.	U. S. Steel Supply Div. U. S. Steel Corp.
	Buffalo Eclipse Corp. B12 Buffalo Steel Corp.	F6 Fretz-Moon Tube Co. F7 Ft. Howard Steel & Wire	M17 Metal Forming Corp. M18 Milton Steel Div	R9 Rome Mfg. Co. R10 Rodney Metals Inc.	V2 Vanadium-Alloys Ste
	B14 A. M. Byers Co. B15 J. Bishop & Co.	F8 Ft. Wayne Metals Inc.	Merritt-Chapman&Scott M21 Mallory-Sharon	S1 Seneca Wire & Mfg. Co.	V3 Vulcan-Kidd Steel Div., H. K. Porter CD
	C1 Calstrip Steel Corp. C2 Calumet Steel Div.,	G4 Granite City Steel Co. G5 Great Lakes Steel Corp.	Metals Corp. M22 Mill Strip Products Co.	S3 Sharon Steel Corp. S4 Sharon Tube Co. S5 Sheffield Div.,	W1 Wallace Barnes Stee
	Borg-Warner Corp. C4 Carpenter Steel Co. C0 Colonial Steel Co.	G6 Green Steel Co. G8 Green River Steel Corp.	N1 National-Standard Co.	Armco Steel Corp. S6 Shenango Furnace Co.	Div., Associated Sprik Corp. W2 Wallingford Steel Co
		H1 Hanna Furnace Corp. H7 Helical Tube Co.	N2 National Supply Co. N3 National Tube Div.,	S7 Simmons Co. S8 Simmons Saw & Steel Co.	W3 Washburn Wire Co. W4 Washington Steel Com
	C12 Columbia Steel & Shaft.		U. S. Steel Corp. N5 Nelsen Steel & Wire Co.	S12 Spencer Wire Corp. S13 Standard Forgings Corp.	W6 Weirton Steel Co. W8 Western Automatic
	C14 Compressed Steel Shaft.	I-1 Igoe Bros. Inc. I-2 Inland Steel Co. I-3 Interlake Iron Corp.	N6 New England High Carbon Wire Co.	S14 Standard Tube Co. S15 Stanley Works	Machine Screw Co. W9 Wheatland Tube Co.
	TT TT 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	I-3 Interlake Iron Corp. I-4 Ingersoll Steel Div., Borg-Warner Corp.	N8 Newman-Crosby Steel N14 Northwest. Steel Rolling Mills Inc.	S17 Superior Drawn Steel Co. S18 Superior Steel Div.,	W10 Wheeling Steel Corp. W12 Wickwire Spencer Stee
	C17 Copperweld Steel Co. C18 Crucible Steel Co.	I-6 Ivins Steel Tube Works I-7 Indiana Steel & Wire Co.	Mills Inc. N15 Northwestern S.&W. Co. N20 Neville Ferro Alloy Co.	Copperweld Steel Co. S19 Sweet's Steel Co.	Div., Colo. Fuel & Irc W13 Wilson Steel & Wire
	C19 Cumberland Steel Co. C20 Cuyahoga Steel & Wire	J1 Jackson Iron & Steel Co.	O4 Oregon Steel Mills	S20 Southern States Steel S23 Superior Tube Co. S25 Stainless Welded Band	W14 Wisconsin Steel Div., International Harves
	C22 Claymont Plant, Wick- wire Spencer Steel Div.,	J3 Jessop Steel Co. J4 Johnson Steel & Wire Co.	P1 Pacific States Steel Corn	S25 Stainless Welded Prod. S26 Specialty Wire Co. Inc. S30 Sierra Drawn Steel Corp.	W15 Woodward Iron Co. W18 Wyckoff Steel Co.
L	Colo. Fuel & Iron	J5 Jones & Laughlin Steel	P2 Pacific Tube Co.	S40 Seneca Steel Service	Y1 Youngstown Sheet & T

STRIP	STRIP, Cold-Rolled Alloy Boston T615.90	Weirton, W. Va. W610.80 Youngstown Y110.80	SILICON STEEL
TITRIP, Hot-Rolled Carbon	Carnegie, Pa. S1815.55 Cleveland A715.55	STRIP, Cold-Rolled Ingot Iron Warren, O. R28.175	C.R. COILS & CUT LENGTHS (22 Ga.) Arma- Fully Processed (25 lower) Field ture tric Motor mo
Ala. City, Ala. (27) R2	Dover, O. G6	STRIP, C.R. Electrogalvanized Cleveland A77.425*	BeechBottom, W. Va. W10 11.70 12.40 13.55 14.65
Ashland, Ky. (8) A105.10	FranklinPark, Ill. T615.55 Harrison, N.J. C1815.55	Dover, O. G67.425* Evanston, Ill. M227.525*	GraniteCity,Ill. G4 9.975*11.30* 12.00* 13.15*
Sessemer, Ala. T25.10 Sirmingham C155.10	Indianapolis S4115.70 LosAngeles S4117.75	McKeesport, Pa. E107.50* Riverdale, Ill. A17.525*	Mansfield, O. E6 9.875 11.70* 12.40* 13.55*14.65*
3uffalo(27) R25.10 Conshohocken, Pa. A35.15	Pawtucket, R.I. N815.90	Warren, O. B9, S3, T5.7.425* Worcester, Mass. A77.975	Niles, O. M21 9.875 11.70 12.40 13.55 14.65
Detroit M15.10	Riverdale, Ill. A115.55 Sharon, Pa. S315.55	Youngstown S417.425*	Vannergrift, 72. Use 1.70 12.40 13.55 14.65 Varren, O. R2 9.875*11.70 12.40 13.55 14.65 Zanesville, O. A10 11.70 † 12.40 13.55 14.65
Fairfield, Ala. T25.10	Worcester, Mass. A715.85 Youngstown S4115.55	*Plus galvanizing extras.	\$10101 0.10
Fontana, Calif. K15.825 Fary, Ind. U55.10	STRIP Cold-Polled	STRIP, Galvanized (Continuous)	Vandergrift, Pa. U5 8.10 Mansfield, O. E6 8.10
nd, Harbor, Ind. I-2, Y1.5.10 hnstown, Pa. (25) B2 5.10	High-Strength, Low-Alloy	Farrell, Pa. S37.50 Sharon, Pa. S37.50	SHEETS (22 Ga., coils & cut lengths) T-72 T-65 T-58 T-52
Lackaw'na, N.Y. (25) B2.5.10 Los Angeles (25) B35.85	Dearborn, Mich. S310.80	TIGHT COOPERAGE HOOP	Fully Processed (Semiprocessed 1/2c lower)
osAngeles C18.60 Ainnequa, Colo. C106.20	Farrell, Pa. S310.80	Atlanta A115.65 Farrell,Pa. S35.525	ReechBottom, W. Va. W10 15.70 16.30 16.80 17.85 BeechBottom, W. Va. 15.70 16.30 16.80 17.85 Vandergrift, Pa. U5 15.70 16.30 16.80 17.85 Zanesville, O. A10 15.70 16.30 16.80 17.85
Riverdale, Ill. A15.10 San Francisco S76.60	Sharon, Pa. S310.80	Sharon, Pa. S35.525	Grain Oriented
Reattle (25) B3 6.10 Reattle N14 6.60	CTRIP C LLEVILL	Youngstown U55.525 26- 0.41- 0.61- 0.81- 1.06-	LENGTHS (22 Ga.) T-100 T-90 T-80 T-73 T-66 T-72
Sharon, Pa. S35.10	Spring Steel (Annealed) 0.	40C 0.60C 0.80C 1.05C 1.35C	Butler, Pa. All 17 10 18 10 19 70 20.20 20.70 15.70
il.SanFrancisco (25) B35.85 ilparrowsPoint,Md. B25.10	Boston T6		Warren, O. R2
Narren, O. R2	Carnegie, Pa. S18	8.95 10.40 12.60 15.60 8.95 10.40 12.60 15.60 18.55	*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed½c lower. ††Coils only.
Youngstown U55.10	Dearborn, Mich. 83 Detroit D2	9.05 10.50 12.70	
STRIP, Hot-Rolled Alloy	Dover, O. G6	8.95 10.40 12.60 15.60 18.55 8.95 10.40 12.60 15.60	WIRE Portsmouth, O. P129.75 Roebling, N.J. R510.05 S. Chicago, Ill. R29.76
Carnegie, Pa. S188.40	Farrell, Pa. S3	8.95 10.40 12.60 15.60 18.55 0.05 10.40 12.60 15.60	Low Carbon S.SanFrancisco C1010.10
Gary, Ind. U58.40	FranklinPark,Ill. T6 Harrison,N.J. C18	12.90 16.10 19.30	Alignippa, Pa. J58.00 Struthers, O. Y19.05
Ind. Harbor, Ind. Y18.40	Indianapolis S41 1 LosAngeles C1 1	1.15 12.60 14.80 17.80	Alton, Ill. L18.20 Waukegan, Ill. A79.75
Los Angeles B39.60	LosAngeles S41 1 NewBritain,Conn. S15	9,40 10.70 12.90 15.90 18 85	Buffalo W128.00 WIRE MB Spring, High-Carbon
Newport, Ky. A28.40	NewCastle,Pa. B4, E5 NewHaven,Conn D2 NewKensington,Pa. A6	9.40 10.70 12.90 15.90	Cleveland A7, C208.00 Aliquippa, Pa. J59.75
S.Chicago, Ill. W148.40	New York W3 Pawtucket,R.I. N8	10.70 12.90 16.10 19.30	Donora, Pa. A79.75
1	Riverdale, Ill. A1	9.05 10.40 12.60 15.60 18.55	Fairfield, Ala. 12 8.10 December 12 9.75
STRIP, Hot-Rolled High-Strength, Low-Alloy	Sharon, Pa. S3	8.95 10.40 12.60 15.60 18.55 10.70 12.90 15.90 18.85	Houston S5
Ashland, Ky. A107.575	Wallingford, Conn. W2	9,40 10.70 12.90 15.90 18.75 8,95 10,40 12.60 15.60 18.55	Johnstown, Pa. B2300 Johnstown, Pa. B210.00
Conshohocken, Pa. A3 7.578	Worcester, Mass. A7, T6 Youngstown S41	9.50 10.70 12.90 15.90 18.85	KansasCity, Mo. 858.20 LOSA 119 Mass (12) N6 .10.05
Ecorse, Mich. G57.578	5	Up to 0.81- 1.06- 0.80C 1.05C 1.35C	Los Angeles B3
Farrell, Pa. S37.578 The Gary, Ind. U57.578 Ind Harbor Ind. L-2 V1 7.578		18.85 22.95 27.80	N. Tonawanda, N. Y. Bil . S. O Paimer, Mass. Calif Cil 10.70
i Lackawanna, N.Y. B2 7.578	Fostoria, O. S1	19.05 22.15 19.20 23.30 28.15	Pittsburg, Calif. CII
3 Seattle (25) B38.57		18.85 22.95 27.80 18.85 22.95 27.80	Rankin, Pa. At
S.Chicago, Ill. W147.578 S.SanFrancisco (25) B3.8.328	Palmer, Mass. W12	18.85 18.85 22.95 27.80	S.SanFrancisco Cit Spairtows C., Vi
SparrowsPoint,Md. B2 .7.578 Warren,O. R27.578	Worcester, Mass. A7, T6	18.85 22.95 27.80 19.20 23.30 28.15	Sterling III N158.10 Waukegan, III. A79.75
Weirton, W. Va. W67.578 Youngstown U5, Y17.578			Struthers, O. 118.00 Wor ster, Massier, Ma
STRIP HAR BUILDING	TIN MILL PRODUC		Worcester, Mass. At WIRE, Fine & Wedvingto 2013
STRIP, Hot-Rolled Ingot Iron Ashland, Ky. (8) A105,33	Aliquippa, Pa. J5	\$9.10 \$9.35 \$9.75	WIRE, Cold Heading Carbon Bartonville, III. 16.30
Warren, O. R25.87	Fairless, Pa. U5	9.20 9.45 9.85 9.75 10.00 10.40	Elyria, O. W8
STRIP, Cold-Rolled Carbon	Gary, Ind. U5	9.10 9.35 9.75	Buffalo W12
Anderson, Ind. G67.42 Baltimore T67.42	IndianaHarbor, Ind. I-2, Y1	9.10 9.35 9.75	Donora, Pa. At
Boston T6	Niles, O. R2	9.75 10.00 10.40	Johnstown, Pa. B213.40 Kokomo, Ind. C1616.30
Cleveland A7, J57.425 Dearborn, Mich. S37.425	Yorkville, O. W10	9.10 9.35 9.75	Minnequa, Colo. C10
Detroit D2, M1, P207.425 Dover, O. G67.425 Evanston, Ill. M227.525	ELECTROLYTIC TIN-COATED SHE	ET (20-27 Ga.; Dollars per 100 lb) 7.90 8.10	NewHaven, Conn. A7 . 12.95 Palmer, Mass. W12
Farrell, Pa. S37.42 Follansbee, W. Va. F47.42	Niles, O. R2	7.90 8.10 8.30	Pittsburg, Calif. C1113.45 Waukegan, III. A713.45 Portsmouth, O. P1212.65 Worcester, Mass. A7, J6.16.60
Fontana, Calif. K19.24 Franklin Park, Ill T67.52	TIN PLATE, American 1.25 1.50		Roepling, N.J. Ro 12.50 MIRE Tire Bead
Ind. Harbor, Ind. Y17.42. Indianapolis S417.57.	5 Aliquippe Pa J5 \$10.40\$10.65	SparrowsPoint,Md. B28.25 Weirton,W.Va. W68.20	Struthers, O. Y1 13.40 Bartonville, III. R4 Trenton, N.J. A7 12.95 Monessen, Pa. P16 17.15
LosAngeles C1, S419.3 McKeesport, Pa. E107.52			Waukegan, Ill. A712.65 Roebling, N.J. Rowner, Worcester, Mass. A712.95
NewBedford, Mass. R10 7.87 NewBritain, Conn. S15 .7.87			ROPE WIRE Unhalstery Spring Partonville III. K413.45
NewCastle, Pa. B4, E5 .7.42 NewHaven, Conn. D27.87	5 Cm Pt Md B2 10.40 10.6		Aliquippa, Pa. J59.75 Buffalo W1213.45
NewKensington, Pa. A6 7.42 Pawtucket, R.I. R3 7.97	Weirton, W. Va. W6 10.40 10.66	705	Buffalo W129.75 Johnstown, 1 a. Da13.45
Pawtucket, R.I. N87.97 Philadelphia P247.87	BLACK PLATE (Base Box)	Yorkville, O. W107.85	
	5 Aliquippa, Pa. J5\$8.20		Johnstown, Pa. B29.73 Portsmouth, O. 112 Kansas City, Mo. S510.00 Roebling, N.J. R513.74
Sharon, Pa. S37.42	5 Fairless, Fa. 058.8	Irvin Pa II59.70	
Wallingford, Conn. W27.87	5 GraniteCity.Ill G48.3	ROOFING SHORT TERNES	NewHaven, Conn. A7 10.05 Worcester, Mass. J4 13.70 NewHaven, Mass. W2 10.05 (A) Plow and Mild Plow
	5 Ind.Harbor,Ind. I-2, Y1.8.20 5 Irvin,Pa. U5		NewHaven, Conn. A. 10.05 (A) Plow and Mild Plow Palmer, Mass. W2 . 10.05 (A) Plow and Mild Plow Pittsburg, Calif. C11 10.70 add 0.25c for Improved Plow

December 15, 1958

1	VIRE, Cold-Rolled Flat	Fairfield, Ala. T210.60	An'ld Galv.	(Full container)	Longer than 6 in.:
	Anderson, Ind. G612.35 Baltimore T612.65	Jacksonville, Fla. M810.70	WiRE (16 gage) Stone Stone Ala. City, Ala. R2 17.85 19.40**	Hot Pressed & Cold Punched:	% in. and smaller %, %, and 1 in+
E	Boston T6	Johnstown, Pa. B2 10.60 Joliet, Ill. A7 10.60	Bartonville K417.95 19.75	% in. to 1½ in., incl. 56.0	6 in. and shorter:
	Buffalo W12	KansasCity, Mo. S510.85 Kokomo, Ind. C1610.70	Craw'dsville M8 17.95 19.8011		% in. and smaller %, %, and 1 in+
6	Crawfordsville.Ind. M8 12 35	Los Angeles B311.40 Minnequa. Colo. C1010.85	Houston S518.10 19.65**	14 in. and smaller 62.0	Longer than 6 in.:
I	Parrell, Pa. S3	Pittsburg, Calif. C1111.40 S.Chicago, Ill. R210.60	Jacksonville M8 17.95 19.80‡‡ Johnstown B217.85 19.658		
I	rostoria, O. S1	S.SanFrancisco C1011.40 SparrowsPt.,Md. B210.70	Kan.City, Mo. 8518.10 Kokomo C1617.25 18.80†	Hex Nuts, Finished (Incl.	Flat Head Cap Screws: % in. and smaller,
1 1	Lokomo.ind. C1612.35 Massillon.O. R8 12.35	Sterling, Ill. (37) N1510.70	Minnequa C1018.10 19.65** P'lm'r, Mass. W12 18.15 19.70†	% in, and smaller 65.0	6 in. and shorter+. Setscrews, Square Head,
A A	Inwaukee C2312.55	Coil No. 6500 Interim	Pitts., Calif. C11.18.20 19.75†	1% in. and larger 51.5	
1 5	Palmer.Mass. W1212.65 Pawtucket.R.I. N811.95	AlabamaCity, Ala. R2 .\$10.65 Atlanta A1110.75	Sterling(37)N15 17.25 19.05††	(Incl. Slotted):	6 in. and shorter+
F	Riverdale.III. A1	Bartonville, Ill. K410.75 Buffalo W1210.65	Wankegan A7 17 85 10 40+	% in. to % in., incl. 65.0	
S	Sharon.Pa. S3	Chicago W1310.65 Crawfordsville.Ind. M8.10.75		1% in. and larger 51.5	KITETS
1 1	Frenton, N.J. R5 12.65 Varren, O. B9 12.35	Donora, Pa. A710.65 Duluth A710.65	(6 to 8 gage) An'ld Galy		F.o.b. Cleveland and freight equalized with Pi
V	Vorcester, Mass. A7, T6.12.65	Fairfield, Ala. T2 10 a5	Aligniana T5 2 65 0 225\$	per cent off list, f.o.b. mill) Hex Head Cap Screws,	burgh, f.o.b. Chicago and freight equalized with
	AILS, Stock Col.	Houston S5	Bartonville (48) K4.9.10 9.775	Coarse or Fine Thread,	mingham except where equivation is too great.
P.	AlabamaCity,Ala. R2173 Aliquippa,Pa. J5173	Johnstown, Pa. B2 10.65 Joliet, Ill. A7 10.65	Claveland A7 0 00	6 in, and shorter:	Structural ½ in., larger 12
I E	Sartonville, Ill. K4	KansasCity, Mo. S5 10.90 Kokomo, Ind. C16 10.75	Domesto De 47 0 00 0 FF	%, %, and 1 in 16.0	and shorter: 15.0%.
1 6	Cleveland A9	Minnegus Colo Gio	Duluth A79.00 9.55†	PRESTRESSED STRA	ND
I	Donora, Pa. A7	S Chicago III Ba	Houston(48) 85 9.25 9.80**	(High strength, stress relieve	d; 7 wire uncoated. Net pra
Ē	Tairfield Ala. T2	SparrowsPt., Md. B2 . 10.75	Johnstown B2(48) 9.00 9.6758 Joliet, Ill. A7 9.00 9.55†	per 1000 ft, 40,000 lb and ov	- Standard Diameter, Inches
	Houston S5	Sterling, Ill. (37) N1510.75	Kans.City(48) S5.9.25 9.80** Kokomo(48) C16 9.10 9.65†	1/4 Alton.Ill. L1 \$32.1	4 5/16 3/8 7/16 14
J.	ohnstown,Pa, B2	BALE TIES, Single Loop Col.	LosAngeles B3 9.95 10.6258 Monessen (48) P7.8.65 9.358	Buffalo W12 32.1 Cleveland A7 32.1	5 48.20 61.55 81.10 100
E	okomo Ind C18	AlabamaCity,Ala. R2212 Atlanta A11214	Palmer, Mass. W12 9.30 9.85† Pitts., Calif. C119.95 10.50†	KansasCity, Mo. U3 32.1 Monessen. Pa. P16 32.1	5 48.20 61.55 81.10 105 5 48.20 61.55 81.10 105
l n	Innequa, Colo. C10178	Bartonville, Ill. K4 214 Crawfordsville, Ind. M8 . 214	Rankin, Pa. A79.00 9.55† S.Chicago R29.00 9.55**	NewHaven, Conn. A7 32.1 Pittsburg, Calif. C11	.5 48.20 61.55 81,10 10 5
1 6	Panlein D192	Donora, Pa. A7212 Duluth A7	S.SanFran, C109.95 10.50**	Pueblo, Colo, W12 32.1 Roebling, N.J. R5 32.1	5 48.20 61.55 81.10 105
l s	tankin.Pa. A7	Houston S5	Spar'wsPt. (48) B2 9.10 9.775 Sterling (48) N15 9.25 9.925†† St'ling (1) (48) N15 9.15 9.925††	St. Louis L8	15 43.40 55.40 73.00 99 5 48.20 61.55 81.10 108
8 2	terling.Ill. (7) N15175	Jacksonville, Fla. M8 214 Joliet, Ill. A7 212	St'ling(1)(48)N159.159.825†† Struthers.O. Y19.00 9.65‡ Worsester Maga A.7 0.800 0.65‡		
	, of cester, Mass. A7179	KansasCity, Mo. S5217 Kokomo, Ind. C16214	Worcester, Mass. A7 9.30 9.85†	RAILWAY MATERIA	
G	(To Wholesalers; per cwt) talveston, Tex. D7\$10.30	Minnequa, Colo. C10 217 Pittsburg, Calif. C11 236	Based on zinc price of: *13.50. †5c. \$10c. ‡Less		Standard—— Tee Ri
	IAILS, Cut (100 lb keg)	S.Sanfrancisco C10 236	**Subject to zinc equaliza-	Bessemer, Pa. U	No. 1 No. 2 No. 2 Uni 5.75 5.65
V	To Dealers (33) Wheeling, W. Va. W10 \$9.80	SparrowsPt.,Md. B2214 Sterling,Ill.(7) N15214	tion extras.	Ensley, Ala. T2	5.75 5.65 6
1 1-				Fairfield, Ala. 12	
A	dabamaCity Ala Ro	FENCE POSTS	FASTENERS	Fairfield, Ala. T2	5.75 5.65
A A A	OLISHED STAPLES Col. Alabama City, Ala. R2175liquippa, Pa. J5173	Birmingham C15177	(Base discounts, shipments of one to four containers, per	Gary Ind. U5	5.75 5.65 (16) 6 (16) 6
A A B C	OLISHED STAPLES LabamaCity, Ala. R2175 Lliquippa, Pa. J5173 tlanta A11	Birmingham C15177 ChicagoHts.,Ill. C2, I-2177 Duluth A7	(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)	Gary Ind. U5	5.75 5.65 (16)6. 5.75 5.65 5.75
A A B C D	Otished Staples Col. Labama City, Ala. R2 175 .liquippa, Pa. J5 175 .tlanta A11 177 .artonville, Ill. K4 177 rawfordsville, Ind. M8 177 romora, Pa. A7 173 .bullth A7 173	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b, mill) BOLTS Machine Rolts	Gary Ind. U5 Huntington, W. Va. C15 Johnstown, Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steelton, Pa. B2 Williamsport, Pa. S19	5.75 5.65
A A B C D D F H	OttsHE STAPLES Col. LabamaCity, Ala. R2 175 Liquippa, Pa. J5 173 Litanta Al1 177 Lartonville, Ill. K4 177 rawfordsville, Ind. M8 177 Ouluth A7 173 alrfield, Ala. T2 173 Cluston S5 173	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b, mill) BOLTS Machine Bolts Full Size Body (cut thread) ¼ in. and smaller	Gary Ind. U5 Huntington, W. Va. C15 Johnstown, Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steelton, Pa. B2 Williamsport, Pa. \$19 TIE PLATES	5.75 5.65
A A A B C D D D F H J J J	Otished Stapeles Col. LabamaCity, Ala. R2 175 Liquippa, Pa. J5 173 Litanta A11 177 Lartonville, Ill. K4 177 rawfordsville, Ind. M8 177 lonora, Pa. A7 173 luluth A7 173 lartfield, Ala. T2 173 louston S5 180 acksonville, Fla. M8 177 lonstony Pa. 170 long P	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b, mill) BOLTS Machine Boits Full Size Body (cut thread) ¼ in. and smaller 3 in. and shorter 55.0 3¼ in. thru 6 in 50.0	Gary Ind. U5 Huntington, W. Va. C15 Johnstown, Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steelton, Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2	5.75 5.65
AAAAAB COD D F H J: J: J: J: K	Otished Stapeles Col. LabamaCity, Ala, R.2 175 Liquippa, Pa, J5 173 Ltlanta A11 177 Lartonville, Ill, K4 177 rawfordsville, Ind, M8 177 lonora, Pa, A7 173 luluth A7 173 luluth A7 173 louston S5 180 acksonville, Fla, M8 177 lonstown, Pa, B2 175 liet, Ill, A7 173 lansasCity, Ms, S5	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b, mill) BOLTS Machine Boits Full Size Body (cut thread) in. and smaller 3 in. and shorter 55.0 Longer than 6 in 37.0 in. 3 in. & shorter 47.0 in. 3 in. & shorter 47.0	Gary Ind. U5 Huntington, W. Va. C15 Johnstown, Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steelton, Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2 Gary, Ind. U5 Lackawanna, N. Y. B2 Lackawanna, N. Y. B2 Lackawanna, N. Y. C6.875 Minnequa, Colo. C10 7.025	5.75 5.65
AAAABCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	Olished Stapeles Col. LabamaCity, Ala, R.2 175 Liquippa, Pa, J5 173 Litania Al1 177 Lartonville, Ill. K4 177 rawfordsville, Ind. M8 177 Vonora, Pa, A7 173 ruluth A7 173 Lartinuth A7 173 LansasCity, Mo, S5 180 Okomo, Ind. C16 177 Linnequa Col. C10 177 Linnequa C10 177	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b, mill) BOLTS Machine Bolts Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter 55.0 3½ in. thru 6 in 50.0 Longer than 6 in 37.0 5½ in., 3 in. & shorter 47.0 3½ in. thru 6 in 40.0 Longer than 6 in 31.0	Gary Ind. U5 Huntington, W. Va. C15 Johnstown.Pa. B2 Lackawanna, N.Y. B2 Minnequa, Colo. C10 Steelton.Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2 6.875 Gary. Ind. U5 6.875 Minnequa. Colo. C10 7.025 Seattle B3 7.025 Steelton, Pa. B2 6.875	5.75 5.65
AAABCODDFFHJJGKKMMPPR	Olished Stapeles Col. LabamaCity, Ala, R.2 175 Liquippa, Pa, J5 173 Litanta Al1 177 Lartonville, Ill, K4 177 rawfordsville, Ilnd, M8 177 lonora, Pa, A7 173 luluth A7 173 luluth A7 173 larffeld, Ala, T2 173 couston S5 180 acksonville, Fla, M8 177 lonstown, Pa, B2 175 lonit, Ill, A7 173 ansasCity, Mo, S5 180 okomo, Ind, C16 177 (Innequa, Colo, C10 180 darkin Pa, A7 194 larkin Pa, A7 194 larkin Pa, A7 194 litaburg, Calif, C11 194	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b, mill) BOLTS Machine Bolts Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter 55.0 3½ in. thru 6 in 50.0 ½ in., 3 in. & shorter 47.0 3½ in. thru 6 in 40.0 Longer than 6 in 31.0 ½ in. thru 6 in 31.0 ½ in. thru 1 in.; 6 in and shorter	Gary Ind. U5 Huntington, W. Va. C15 Johnstown. Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steetton. Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2	5.75 5.65 (16) 8.5.75 5.65 6.5.75 5.65 6.5.75 5.65 6.5 7.5.75 5.5 7.5 7.5 7.5 7.5 7.5 7.5 7.
AAABCODDFH HJJJKKMMPRSSS	Otished Stapeles Col. LabamaCity, Ala. R2 175 Liquippa, Pa. J5 173 Litanta A11 177 Lartonville, Ill. K4 177 rawfordsville, Ind. M8 177 Pomora, Pa. A7 173 Pomora, Pa. B2 175 Pomora, Pa.	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b, mill) BOLTS Machine Bolts Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter 55.0 3½ in. thru 6 in 50.0 Longer than 6 in 37.0 ½ in. thru 6 in 40.0 Longer than 6 in 31.0 ¼ in. thru 1 in.: 6 in. and shorter 37.0 Longer than 6 in 31.0	Gary Ind. U5 Huntington, W. Va. C15 Johnstown, Pa. B2 Lackawanna, N.Y. B2 Minnequa, Colo. C10 Steelton, Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2 6.875 Gary, Ind. U5 6.875 Lackawanna, N.Y. B2 Minnequa, Colo. C10 7.025 Seattle B3 7.025 Steelton, Pa. B2 8.875 JOINT BARS Bessemer, Pa. U5 7.25	5.75 5.65 (16)8. 5.75 5.65 6. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 18. TRACK BOLTS, Untreated Cleveland R2 18. KansasCity, Mo. S5 18. Lebanon.Pa. B2 18. Minnequa, Colo. C10 15. Pittsburgh P14 19. Seattle B3 18. SCREW SPIKES Lebanon.Pa. B2 15. STANDARD TRACK SPIKES
AAABCOODFH JJJKKKMPR.S.S.S.S.S.S.S.S.S.S.S.S.S.S.S.S.S.S.S	Olished Stapeles Col. LabamaCity, Ala, R.2 175 Liquippa, Pa, J5 173 Litania Al1 177 Lartonville, Ill, K4 177 Lartonville, Ill, M8 177 Lartonville,	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b, mill) BOLTS Machine Boits Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter 55.0 3½ in. thru 6 in 50.0 Longer than 6 in 37.0 ½ in. thru 6 in 31.0 ½ in. thru 6 in 31.0 ½ in. thru 1 in.; 6 in. and shorter 37.0 ½ in. thru 1 in.; 6 in. and shorter 37.0 Longer than 6 in 31.0 1½ in. and larger: All lengths 31.0 Undersize Body (rolled	Gary Ind. U5 Huntington, W. Va. C15 Johnstown.Pa. B2 Lackawanna, N.Y. B2 Minnequa, Colo. C10 Steelton.Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2 6.875 Gary. Ind. U5 6.875 Minnequa. Colo. C10 7.025 Seattle B3 7.025 Steelton.Pa. B2 6.875 Torrance, Calif. C11 6.875 JOINT BARS	5.75 5.65 (16)8. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 1. TRACK BOLTS, Untreated Cleveland R2 1. KansasCity, Mo. 85 1.8 KansasCity, Mo. 85 1.8 Lebanon.Pa. B2 1.8 Minnequa, Colo. C10 1.5 Pittsburgh P14 1.4 Seattle B3 1.8 SCREW SPIKES Lebanon.Pa. B2 1.5 STANDARD TRACK SPIKES Fairfield, Ala. T2 19 Ind. Harbor, Ind. 1-2, Y1 19 Ind. Harbor, Ind. 1-2, Y1 19
AAABCCDDDFFHJ;JJKKKMMPP,RS:SIS	Olished Stapeles Col. LabamaCity, Ala, R.2 175 Liquippa, Pa, J5 173 Litanta Al1 177 Lartonville, Ill, K4 177 Lartonville, Ill, M8 177 Lartonville,	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b, mill) BOLTS Machine Boits Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter 55.0 3½ in. thru 6 in 50.0 Longer than 6 in 37.0 ½ in. 3 in. & shorter 47.0 3½ in. thru 6 in 31.0 ½ in. thru 1 in.: 6 in. and shorter 37.0 Longer than 6 in 31.0 ½ in. and larger: All lengths 31.0 Undersize Body (rolled thread) ½ in. and smaller:	Gary Ind. U5 Huntington, W. Va. C15 Johnstown.Pa. B2 Lackawanna, N.Y. B2 Minnequa, Colo. C10 Steelton.Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2 6.875 Gary. Ind. U5 6.875 Minnequa. Colo. C10 7.025 Seattle B3 7.025 Steelton.Pa. B2 6.875 Torrance, Calif. C11 6.875 JOINT BARS Bessemer. Pa. U5 7.25 Fairfield, Ala. T2 7.25 Joliet, Ill. U5 7.25 Lackawanna, N.Y. B2 7.25 Minnequa. Colo. C10 7.025 Minnequa. C10 7.025 Minnequa. C10 7.025 Lackawanna, N.Y. B2 7.25 Minnequa. C10 7.25	5.75 5.65 (16) 8. 5.75 5.65 6. 5.75 5.65 6. 5.75 5.65 6. 6. 5.75 5.65 6. 6. TRACK BOLTS, Untreated Cleveland R2 1. KansasCity, Mo. 85 1. M. Lebanon. Pa. B2 1. Minnequa, Colo. C10 1. 57 Pittsburgh P14 1. Seattle B3 1. 8 SCREW SPIKES Lebanon. Pa. B2 1. 5 STANDARD TRACK SPIKES Fairfield, Ala. T2 9 Ind. Harbor, Ind. 1-2, Y1 10 KansasCity, Mo. S5 1. Lebanon. Pa. B2 1. 10 Leban
AAABCODOFFH J.J.J.J.KKMPP.RS.SSSSW	Otished Stapeles Col. LabamaCity, Ala, R.2 175 .liquippa, Pa, J5 173 .tlanta A11 177 .tartonville, Ill, K4 177 .rawfordsville, Ind, M8 177 .romora, Pa, A7 173 .pluth A7 173 .ansasCity, Mo. S5 180 .okomo, Ind, C16 177 .linnequa, Colo. C10 180 .ttsburg, Calif. C11 194 .ankin, Pa, A7 173 .parrowsPt., Md, B2 177 .parrowsPt., Md, B2 177 .parrowsPt., Md, B2 177 .perling, Ill, (7) N15 175 .orcester, Mass. A7 181 E Wire, Automatic Baler .li 41½ Go. J (per 97 lb Net Box)	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill) BOLTS Machine Bolts Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter 55.0 3½ in. thru 6 in 37.0 ½ in. 3 in. & shorter 47.0 3½ in. thru 6 in 40.0 Longer than 6 in 31.0 ½ in. thru 1 in.: 6 in. and shorter 37.0 ½ in. and shorter 37.0 ½ in. and shorter 31.0 ½ in. and smaller: All lengths 31.0 Undersize Body (rolled thread) ½ in. and smaller: 3 in. and smaller: 3 in. and shorter 55.0 3½ in. thru 6 in 55.0 3½ in. thru 6 in 55.0	Gary Ind. U5 Huntington, W. Va. C15 Johnstown. Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steetton. Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2 6.875 Gary. Ind. U5 6.875 Lackawanna, N. Y. B2 6.875 Minnequa, Colo. C10 7.025 Steetton. Pa. B2 6.875 Torrance, Calif. C11 6.875 JOINT BARS Bessemer. Pa. U5 7.25 Pairfield, Ala. T2 7.25 Joilet, Ill. U5 7.25 Minnequa, Colo. C10 7.25 Steelton, Pa. B2 7.25	5.75 5.65
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	Olished Stapeles Col. LabamaCity, Ala, R.2 1.75 Liquippa, Pa, J5 1.73 Liduippa, Pa, J5 1.77 Liduippa, Pa, J7 1.73 Liduippa, Liduip	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill) BOLTS Machine Bolts Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter 55.0 3½ in. thru 6 in 50.0 Longer than 6 in 37.0 ½ in. thru 6 in 40.0 Longer than 6 in 31.0 ½ in. thru 1 in.: 6 in. and shorter 37.0 ½ in. thru 1 in.: 7 in. & shorter 47.0 1½ in. and shorter 31.0 ½ in. and shorter 31.0 ½ in. and shorter 31.0 ½ in. and smaller: 3 in. and smaller: 3 in. and smaller: 3 in. and smaller: 5 in. and smaller: 5 in. thru 6 in 50.0 Carriage Botts Full Size Body (cut thread)	Gary Ind. U5 Huntington, W. Va. C15 Johnstown. Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steelton, Pa. B2 Williamsport, Pa. S19 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2 6.875 Gary. Ind. U5 6.875 Lackawanna, N. Y. B2 6.875 Minnequa. Colo. C10 7.025 Seattle B3 7.025 Steelton, Pa. B2 6.875 Torrance, Calif. C11 6.875 JOINT BARS Bessemer. Pa. U5 7.25 Fairfield, Ala. T2 7.25 Joliet, III, U5 7.25 Lackawanna, N. Y. B2 7.25 Minnequa. Colo. C10 7.25 Steelton, Pa. B2 7.25 Minnequa. Colo. C10 7.25 Steelton, Pa. B2 7.25	5.75 5.65
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	Olished Stapeles Col. LabamaCity, Ala, R.2 175 Liquippa, Pa, J5 173 Liduippa, Pa, J5 177 Liduippa, Pa, J7 173 Liduith A7 173 L	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill) BOLTS Machine Boits Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter 55.0 1½ in. thru 6 in 50.0 Louger than 6 in 37.0 ½ in. thru 6 in 40.0 Longer than 6 in 31.0 ½ in. thru 1 in 6 in. and shorter 37.0 Longer than 6 in 31.0 ½ in. thru 1 in All lengths 31.0 1½ in. and larger: All lengths 31.0 Undersize Body (rolled thread) ½ in. and smorter 55.0 Carriage Boits Full Size Body (cut thread) & Undersize Body (rolled thread)	Gary Ind. U5 Huntington, W. Va. C15 Johnstown, Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steetton, Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2 6.875 Gary, Ind. U5 6.875 Lackawanna, N. Y. B2 6.875 Minnequa, Colo. C10 7.025 Seattle B3 7.025 Steetton, Pa. B2 6.875 Torrance, Calif. C11 6.875 JOINT BARS Bessemer, Pa. U5 7.25 Fairfield, Ala. T2 7.25 Joliet, III, U5 7.25 Lackawanna, N. Y. B2 7.25 Joliet, III, U5 7.25 Steetton, Pa. B2 7.25 Minnequa, Colo. C10 7.25 Steetton, Pa. B2 7.25 Minnequa, Colo. C10 7.25 Steetton, Pa. B2 7.25 Minnequa, Colo. C10 7.25 Steetton, Pa. B2 7.25 Ind. Harbor, Ind. S13 9.125 Johnstown, Pa. B2 9.125	5.75 5.65 (16) 8.5.75 5.65 6.5.75 5.65 7.5.75 5.65 7.5.75 5.65 6.5 7.5.75 5.65 7.5.75 5.65 7.5.75 5.65 7.5.75 5.65 7.5.75 5.65 7.5.75 5.65 7.5.75 5.65 7.5.7
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	OLISHED STAPLES Col. LabamaCity, Ala, R.2 1.75 Liquippa, Pa, J5 1.73 Litania Al 1 1.77 Lartonville, Ill, K4 1.77 Lartonville, Ill, M8 1.77 Lartonville, Ill, A7 1.73 Lartonville, Ill, C1 1.94 Lartonville, Ill, C1 1.94 Lartonville, Ill, C7 1.75 Lartonville, Ill, C8 Lartonville, Ill, C8 Lartonville, Ill, C8 Lartonville, Ill, K4 10.36 Larto	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill) BOLTS Machine Bolts Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter 55.0 13½ in. thru 6 in 50.0 Longer than 6 in 37.0 ½ in. thru 6 in 40.0 Longer than 6 in 31.0 ½ in. thru 1 in.: 6 in. and shorter 37.0 Longer than 6 in 31.0 ½ in. thru 1 in.: 3 in. and shorter 37.0 Longer than 6 in 31.0 ½ in. and shorter 37.0 Longer than 6 in 31.0 1½ in. and smaller: 3 in. and shorter 55.0 3½ in. thru 6 in 50.0 Carriage Bolts Full Size Body (cut thread) & Undersize Body (rolled thread) ½ in. and smaller: 6 in. and smaller:	Gary Ind. U5 Huntington, W. Va. C15 Johnstown. Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steelton. Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2	5.75 5.65 5.75 5.65 6.5 5.75 5.65 7.5.75 5.65 7.5.75 5.65 6.5 TRACK BOLTS, Untreated Cleveland R2 1.5 KansasCity, Mo. S5 1.8 Lebanon. Pa. B2 1.5 Minnequa, Colo. C10 1.5 Pittsburgh P14 1.4 Seattle B3 1.8 SCREW SPIKES Lebanon. Pa. B2 1.5 STANDARD TRACK SPIKES Fairfield. Ala. T2 91 Ind. Harbor. Ind. 1-2, Y1 10 KansasCity, Mo. S5 1.0 Lebanon. Pa. B2 1.0 Minnequa, Colo. C10 1.6 Pittsburgh J5 1.0 Seattle B3 1.0 S Chicago, Ill. R2 1.0
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	Otished Stapeles Col. LabamaCity, Ala, R.2 1.75 .liquippa, Pa, J5 173 .tlanta Al1 1.77 rawfordsville, Ind. M8 1.77 rawfordsville, Ind. M8 1.77 romora, Pa, A7 1.73 .pluth A	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill) BOLTS Machine Boits Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter 55.0 Longer than 6 in 37.0 ½ in. thru 6 in 40.0 Longer than 6 in 31.0 ¼ in. thru 6 in 31.0 ¼ in. thru 1 in.; 6 in. and shorter 37.0 1½ in. and shorter 37.0 1½ in. and shorter 37.0 1½ in. and shorter 31.0 1½ in. and larger; All lengths 31.0 1½ in. and smaller: 3 in. and shorter 55.0 3¼ in. thru 6 in 50.0 Carriage Botts Full Size Body (rolled thread) ½ in. and smaller: 6 in. and shorter 48.0 Larger diameters and longer lengths	Gary Ind. U5 Huntington, W. Va. C15 Johnstown.Pa. B2 Lackawanna, N.Y. B2 Minnequa, Colo. C10 Steelton, Pa. B2 Williamsport, Pa. S19 Williamsport, Pa. S19 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2 6.875 Gary. Ind. U5 6.875 Lackawanna, N.Y. B2 6.875 Minnequa. Colo. C10 7.025 Steelton, Pa. B2 6.875 Torrance, Calif. C11 6.875 Torrance, Calif. C11 6.875 JOINT BARS Bessemer. Pa. U5 7.25 Fairfield, Ala. T2 7.25 Joliet, Ill. U5 7.25 Joliet, Ill. U5 7.25 Lackawanna, N.Y. B2 7.25 Minnequa. Colo. C10 7.25 Steelton, Pa. B2 7.25 Minnequa. Colo. C10 7.25 Steelton, Pa. B2 7.25 AXLES Ind. Harbor, Ind. S13 9.125 Johnstown, Pa. B2 9.125 Footnotes (1) Chicago base, (2) Angles, flats, bands, (3) Merchant,	5.75 5.65 (16) 8. 5.75 5.65 6. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.76 5.65 7. 5.77 5.65 7. 5.78 5.65 7. 5.79 5.65 7. 5.79 5.65 7. 5.70 5. 5.70 5.
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	Olished Stapeles Col. LabamaCity, Ala, R.2 1.75 Liquippa, Pa, J5 173 Liduippa, Pa, J7 173 Liduippa, Pa, J7 173 Liduippa, Pa, Pa, Pa, Pa, Pa, Pa, Pa, Pa, Pa, P	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill) BOLTS Machine Boits Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter 55.0 3½ in. thru 6 in 50.0 Longer than 6 in 37.0 ½ in. 3 in. & shorter 47.0 3½ in. thru 6 in 40.0 Longer than 6 in 31.0 ½ in. thru 1 in.: 6 in. and shorter 37.0 1½ in. and shorter 31.0 ½ in. and shorter 31.0 ½ in. and shorter 31.0 ½ in. and smaller: 3 in. and smaller: 3 in. and shorter 55.0 Carriage Boits Full Size Body (cut thread) & Undersize Body (rolled thread) ½ in. and smaller: 6 in. and shorter 48.0 Larger diameters and longer lengths 55.0 Larger diameters and Larger diameters and longer lengths 55.0	Gary Ind. U5 Huntington, W. Va. C15 Johnstown. Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steetton. Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2 6.875 Gary. Ind. U5 6.875 Lackawanna, N. Y. B2 6.875 Minnequa, Colo. C10 7.025 Seattle B3 7.025 Steetton. Pa. B2 6.875 Torrance, Calif. C11 6.875 JOINT BARS Bessemer. Pa. U5 7.25 Pairfield, Ala. T2 7.25 Joliet, Ill. U5 7.25 Minnequa, Colo. C10 7.25 Torrance, B2 7.25 Minnequa, Colo. C10 7.25 Minnequa, Colo. C10 7.25 Steelton, Pa. B2 9.125 Footnotes (1) Chicago base, (2) Angles, flats, bands, (3) Merchant, (4) Reinfording	5.75 5.65 5.75 5.65 6.5 5.75 5.65 7.5 5.75 5.65 7.5 5.75 5.65 7.5 5.75 5.65 6.5 TRACK BOLTS, Untreated Cleveland R2 1.5 KansasCity, Mo. 85 1.8 KansasCity, Mo. 85 1.8 Lebanon.Pa. B2 1.6 Minnequa, Colo. C10 1.5 Pittsburgh P14 1.4 Seattle B3 1.5 SCREW SPIKES Lebanon.Pa. B2 1.5 STANDARD TRACK SPIKES Fairfield. Ala. T2 91 Ind. Harbor, Ind. I-2, Y1 1.6 KansasCity, Mo. 85 1.0 Lebanon.Pa. B2 1.0 Minnequa, Colo. C10 1.6 Pittsburgh J5 1.0 Seattle B3 1.0 S Chicago, Ill. R2 1.0 Struthers, O. Y1 1.6 Youngstown R2 1.0 (25) Bar mill bands. (26) Bold. in mill zone, 6.295 (27) Bar mill bands. (28) Bolderized.
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	OLISHED STREES Col. LabamaCity, Ala. R2 1.75 Liquippa, Pa. J5 1.73 Liquippa, Pa. J5 1.77 Liquippa, Pa. J6 1.77 Liquippa, Pa. J7 1.73 Liquippa, Pa. Liquipp	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b, mill) BOLTS Machine Bolts Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter 55.0 3½ in. thru 6 in 50.0 Longer than 6 in 37.0 ½ in. thru 6 in 40.0 Longer than 6 in 31.0 ½ in. thru 1 in.: 6 in. and shorter 37.0 ½ in. and shorter 31.0 ½ in. and shorter 31.0 1½ in. and shorter 31.0 1½ in. and smaller: 3 in. and smaller: 3 in. and smaller: 6 in. and smaller: 7 8.0 Larger diameters and longer lengths 35.0 Larger and smaller: 8 in. and smaller: 9 10 10 10 10 10 10 10 10 10 10 10 10 10	Gary Ind. U5 Huntington, W. Va. C15 Johnstown.Pa. B2 Lackawanna, N.Y. B2 Minnequa, Colo. C10 Steelton.Pa. B2 Williamsport, Pa. S19 TiE PLATES Fairfield, Ala. T2 6.875 Gary. Ind. U5 6.875 Lackawanna, N.Y. B2 6.875 Minnequa. Colo. C10 7.025 Steelton. Pa. B2 6.875 Torrance, Calif. C11 6.875 JOINT BARS Bessemer. Pa. U5 7.25 Fairfield. Ala. T2 7.25 Joliet, Ill. U5 7.25 Lackawanna, N.Y. B2 7.25 Minnequa. Colo. C10 7.25 Steelton, Pa. B2 7.25 Minnequa. Colo. C10 7.25 Steelton, Pa. B2 7.25 AXLES Ind. Harbor, Ind. S13 9.125 Johnstown, Pa. B2 9.125 Footnotes (1) Chicago base, (2) Angles, flats, bands, (3) Merchant, (4) Reinforcing, (5) 1½ to under 17/16 in; 17/16 to under 17/16 in; 17/16 to under 17/16 in;	5.75 5.65
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	Olished Stapeles Col. LabamaCity, Ala, R.2 1.75 Liquippa, Pa, J5 173 Liduippa, Pa, J7 173 Liduith A7 173 Liduith A	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill) BOLTS Machine Boits Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter 55.0 3½ in. thru 6 in 50.0 Longer than 6 in 37.0 ½ in. 3 in. & shorter 47.0 ½ in. 3 in. & shorter 47.0 ½ in. thru 6 in 31.0 ½ in. thru 1 in.; 6 in. and shorter 37.0 Longer than 6 in 31.0 Longer than 6 in 31.0 ½ in. thru 1 in.; 6 in. and shorter 37.0 Longer than 6 in 31.0 Undersize Body (rolled thread) ½ in. and smaller: 3 in. and smaller: 3 in. and shorter 55.0 Carriage Boits Full Size Body (cut thread) & Undersize Body (rolled thread) ½ in. and smaller: 6 in. and shorter 48.0 Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Boits ½ in. and smaller: 6 in. and shorter 48.0	Gary Ind. U5 Huntington, W. Va. C15 Johnstown.Pa. B2 Lackawanna, N.Y. B2 Minnequa, Colo. C10 Steelton, Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2 6.875 Gary, Ind. U5 6.875 Lackawanna, N.Y. B2 6.875 Minnequa, Colo. C10 7.025 Seattle B3 7.025 Steelton, Pa. B2 6.875 Torrance, Calif. C11 6.875 JOINT BARS Bessemer. Pa. U5 7.25 Fairfield, Ala. T2 7.25 Joliet, Ill. U5 7.25 Steelton, Pa. B2 7.25 Minnequa, Colo. C10 7.025 Steelton, Pa. B2 7.25 Lackawanna, N.Y. B2 7.25 Minnequa, Colo. C10 7.25 Steelton, Pa. B2 7.25 Steelton, Pa. B2 7.25 AXLES Ind. Harbor, Ind. S13 9.125 Johnstown, Pa. B2 9.125 Footnotes (1) Chicago base, (2) Angles, flats, bands, (3) Merchant, (4) Reinforcing, (5) 1½ to under 17/16 in.; 17/16 to under 17/16 in., inclusive, 7.05c, (6) Chicago or Birm, base,	5.75 5.65
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	OLISHED STREES Col. LabamaCity, Ala. R.2 1.75 Liquippa, Pa. J5 1.73 Litanta Al.1 1.77 Lartonville, Ill. K.4 1.77 Lartonville, Ill. K.5 1.73 Lartonville, Ill. M.8 1.77 Lartonville, Ill. M.8 1.77 Lartonville, Ill. M.8 1.77 Lartonville, Ill. A.7 1.73 Lartonville, Ill. C.1 1.94 Lartonville, Ill. C.1 1.94 Lartonville, Ill. C.1 1.94 Lartonville, Ill. C.1 1.75 Lartonville, Ill. K.4 10.36 Lartonville, Ill. K.4 10.3	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill) BOLTS Machine Boits Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter 55.0 3½ in. thru 6 in 50.0 Longer than 6 in 37.0 ½ in. 3 in. & shorter 47.0 3½ in. thru 6 in 40.0 Longer than 6 in 31.0 ½ in. thru 1 in.: 6 in. and shorter 37.0 Longer than 6 in 31.0 ½ in. thru 1 in.: 7 in. and shorter 31.0 ½ in. and shorter 31.0 ½ in. and shorter 31.0 ½ in. and smaller: 3 in. and shorter 55.0 Carriage Boits Full Size Body (cut thread) & Undersize Body (rolled thread) ½ in. and smaller: 6 in. and shorter 48.0 Larger diameters and longer lengths 55.0 Larger diameters and Fitting Up Boits ½ in. and smaller: 6 in. and smaller: 7 in. and smaller: 8 in. and smaller: 9 in. and sm	Gary Ind. U5 Huntington, W. Va. C15 Johnstown. Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steetton. Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2	5.75 5.65
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	OLISHED STREES Col. LabamaCity, Ala, R.2 1.75 Liquippa, Pa, J5 1.73 Liquippa, Pa, J5 1.73 Liquippa, Pa, J5 1.73 Litanta Al 1 1.77 Lartonville, Ill, K4 1.77 Lartonville, Ill, K8 1.70 Lartonville, Ill, M8 1.77 Lartonville, Ill, M8 1.77 Lartonville, Ill, M8 1.77 Lartonville, Ill, A7 1.73 Lartonville, Ill, A7 1.73 Lartonville, Ill, C1 1.79 Lartonville, Ill, C1 1.79 Lartonville, Ill, C7 1.75 Lartonville, Ill, C7 1.75 Lartonville, Ill, C7 1.75 Lartonville, Ill, C7 1.75 Lartonville, Ill, C8 1.75 Lartonville, Ill, K4 1.0.36 Lartonville, Ill, M8 1.0.36 Lartonville, Ill, K8 1.0.36 Lartonville, Ill, K9 1.0	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill) BOLTS Machine Bolts Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter 55.0 3½ in. thru 6 in 50.0 Longer than 6 in 37.0 ½ in. thru 6 in 40.0 Longer than 6 in 31.0 ¼ in. thru 6 in 31.0 ¼ in. thru 1 in.; 6 in. and shorter 37.0 1½ in. and shorter 37.0 1½ in. and larger; All lengths 31.0 1½ in. and smaller: 3 in. and shorter 55.0 3½ in. thru 6 in 50.0 Carriage Botts Full Size Body (rolled thread) ½ in. and smaller: 6 in. and shorter 48.0 Larger diameters and longer lengths 35.0 Lag. Plow, Tap. Blank, Step. Elevator. Tire, and Fitting Up Bolts ½ in. and smaller: 6 in. and shorter 48.0 Larger diameters and longer lengths 35.0 Lag. Plow, Tap. Blank, Step. Elevator. Tire, and Fitting Up Bolts ½ in. and smaller: 6 in. and shorter 48.0 Larger diameters and longer lengths 35.0 High Tensile Structural Bolts (Reg. semifinished hex head bolts. standard heaver	Gary Ind. U5 Huntington, W. Va. C15 Johnstown. Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steetton. Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2	5.75 5.65 (16)8. 5.75 5.65 6. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.76 5.65 7. 5.77 5.65 7. 5.78 5.65 7. 5.79 5.65 7. 5.70 5. 5.70
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	OLISHED STREES Col. LabamaCity, Ala. R2 175 Liquippa, Pa. J5 173 Litanta Al1 177 Lartonville, Ill. K4 177 Lartonville, Ill. K8 177 Lartonville, Ill. M8 177 Lartonville, Ill. M8 177 Lartonville, Ill. A7 173 Lartonville, Ill. A7 173 Lartonville, Ill. A7 173 Lartonville, Ill. C1 180 Lartonville, Ill. C1 180 Lartonville, Ill. C7 N15 175 Lartonville, Ill. C7 N15 175 Lartonville, Ill. C7 N15 175 Lartonville, Ill. C8 Lartonville, Ill. K4 10.36 Lartonville, Ill. K4 10.36 Lartonville, Ill. K8 10.36 Lartonville, Ill. K4 10.36 Lartonville, Ill. K8 10.36 Lartonville, Ill. K9 10.26 Lar	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b, mill) BOLTS Machine Bolts Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter 55.0 3½ in. thru 6 in 37.0 ½ in. 3 in. & shorter 4.0 3¼ in. thru 6 in 40.0 Longer than 6 in 31.0 ½ in. thru 1 in.; 6 in. and shorter 37.0 ½ in. thru 1 in.; 6 in. and shorter 31.0 ½ in. thru 1 in.; 8 in. and shorter 31.0 Longer than 6 in 31.0 Longer than 6 in 31.0 ½ in. thru 1 in.; 6 in. and shorter 31.0 Longer than 6 in 31.0 Larger diameters and longer lengths 35.0	Gary Ind. U5 Huntington, W. Va. C15 Johnstown, Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steelton, Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala, T2 6.875 Gary, Ind. U5 6.875 Gary, Ind. U5 6.875 Minnequa, Colo. C10 7.025 Steelton, Pa. B2 7.025 Torrance, Calif. C11 6.875 JOINT BARS Bessemer, Pa. U5 7.25 Fairfield, Ala, T2 7.25 Joliet, Ill. U5 7.25 Steelton, Pa. B2 7.25 Minnequa, Colo. C10 7.25 Steelton, Pa. B2 7.25 Minnequa, Colo. C10 7.25 Steelton, Pa. B2 7.25 Minnequa, Colo. C10 7.25 Steelton, Pa. B2 9.125 Footnotes (1) Chicago base, (2) Angles, flats, bands, (3) Merchant, (4) Reinforcing, (5) 1½ to under 1.7/16 in.; 1.7/16 to gase 2 cols, lower, (8) 16 Ga and heavier, (9) Merchant quality; add 6.356 for special quality; (10) Pittsburgh base, (11) Cleveland & Pitts base,	5.75 5.65 (16)8. 5.75 5.65 6. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 7. 5.76 5.65 7. 5.77 5.65 7. 5.78 5. 5.78 5. 5. 5.78 5. 5. 5.78 5. 5. 5.78 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	Otished Stapeles Col. LabamaCity, Ala. R2 1.75 Liquippa, Pa. J5 1.73 Liquippa, Pa. J5 1.77 Liquippa, Pa. J6 Liquippa, Pa. J6 Liquippa, Pa. J7	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill) BOLTS Machine Bolts Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter 55.0 3½ in. thru 6 in 30.0 Longer than 6 in 40.0 Longer than 6 in 40.0 Longer than 6 in 31.0 ½ in. thru 6 in 40.0 Longer than 6 in 31.0 ½ in. thru 1 in.: 6 in. and shorter 37.0 ½ in. and shorter 31.0 ½ in. and shorter 31.0 ½ in. and smaller: 3 in. and smaller: 3 in. and smaller: 3 in. and shorter 55.0 Carriage Bolts Full Size Body (cut thread) & Undersize Body (rolled thread) ½ in. and smaller: 6 in. and smaller: 6 in. and shorter 48.0 Larger diameters and longer lengths 35.0 Larger diameters and Fitting Up Bolts ½ in. and smaller: 6 in. and shorter 48.0 Larger diameters and longer lengths 35.0 Larger diameters and longer lengths	Gary Ind. U5 Huntington, W. Va. C15 Johnstown, Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steelton, Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala, T2 6.875 Gary, Ind. U5 6.875 Gary, Ind. U5 6.875 Minnequa, Colo. C10 7.025 Steelton, Pa. B2 7.025 Steelton, Pa. B2 6.875 Torrance, Calif. C11 6.875 JOINT BARS Bessemer, Pa. U5 7.25 Fairfield, Ala, T2 7.25 Joliet, Ill. U5 7.25 ALCKawanna, N. Y. B2 7.25 Steelton, Pa. B2 7.25 Minnequa, Colo. C10 7.25 Color, Pa. B2 7.25 Minnequa, Colo. C10 7.25 Color, Pa. B2 7.25 Minnequa, Colo. C10	5.75 5.65 TRACK BOLYS, Untreated Cleveland R2 SamsasCity, Mo. S5 Lebanon. Pa. B2 SCREW SPIKES Lebanon. Pa. B2 STANDARD TRACK SPIKES Fairfield. Ala. T2 Ind. Harbor. Ind. I-2, Y1 MansasCity. Mo. S5 Lebanon. Pa. B2 SCREW SPIKES Lebanon. Pa. B2 STANDARD TRACK SPIKES Fairfield. Ala. T2 Ind. Harbor. Ind. I-2, Y1 MansasCity. Mo. S5 Clebanon. Pa. B2 Minnequa. Colo. C10 Minnequa. Colo. C10 Schieago. III. R2 Struthers. O. Y1 Geattle B3 10 Schieago. III. R2 Struthers. O. Y1 (25) Bar mill bands. (26) Deld. in mill zone, 6.295 Call Widths over % In.; 7.37 for widths % In. and thinar. (32) Biffalo base. (33) To jobbers, deduct 200. (34) 9.80c for cut lengths. (35) 72" and narrower. (36) 54" and narrower. (36) 54" and narrower. (37) Chicago base, 10 poliower.
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	Otished Stapeles Col. LabamaCity, Ala, R.2 1.75 Liquippa, Pa, J5 1.73 Liquippa, Pa, J5 1.73 Liquippa, Pa, J5 1.73 Litanta Al1 1.77 Lartonville, Ill. K4 1.77 Lartonville, Ill. M8 1.78 Lartonville, Ill. M8 1.036 Lartonville, Ill. M9 1	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b, mill) BOLTS Machine Boits Full Size Body (cut thread) in. and smaller 3 in. and shorter 3 in. and shorter 3 in. thru 6 in	Gary Ind. U5 Huntington, W. Va. C15 Johnstown, Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steetton, Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2 6.875 Gary, Ind. U5 6.875 Lackawanna, N. Y. B2 .6.875 Minnequa, Colo. C10 7.025 Steetton, Pa. B2 6.875 Minnequa, Colo. C10 7.025 Steetton, Pa. B2 6.875 Torrance, Calif. C11 .6.875 JOINT BARS Bessemer, Pa. U5 7.25 Fairfield, Ala. T2 7.25 Fairfield, Ala. T2 7.25 Lackawanna, N. Y. B2 .7.25 Lackawanna, N. Y. B2 .7.25 Minnequa, Colo. C10 7.25 Steetton, Pa. B2 7.25 Minnequa, Colo. C10 7.25 Steetton, Pa. B2 7.25 Minnequa, Colo. C10 7.25 Steetton, Pa. B2 7.25 AXLES Ind. Harbor, Ind. S13 9.125 Johnstown, Pa. B2 9.125 Footnotes (1) Chicago base, (2) Angles, flats, bands, (3) Merchant, (4) Reinforcing, (5) 1½ to under 1 7/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05. (6) Chicago or Birm, base, (7) Chicago base 2 cols, lower, (8) 16 Gs. and heavier, (9) Merchant quality; add 0.350 for special quality, (10) Heroland & Pitts, base, (11) Weveland & Pitts, base, (12) Westland & Pitts, base, (13) Add 0.356 for 17 Gs. & heavier, Mass., base, (14) Gage 0.143 to 0.249 in; for gage 0.143 to 0.249 in; for gage 0.143 to 0.249 in; for gage 0.143 and lighter, 5 80c.	5.75 5.65 (16) 8. 5.75 5.65 6. 5.75 5.65 7. 5.75 5. 5.75 7. 5.75 5. 5.75 7. 5.
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	Olished Stapeles Col. LabamaCity, Ala, R.2 1.75 Liquippa, Pa, J5 1.73 Liquippa, Pa, J5 1.73 Liquippa, Pa, J5 1.73 Litanta Al 1 1.77 Lartonville, Ill, K4 1.77 Lartonville, Ill, M8 1.77 Lartonville, Ill, A7 1.73 LansasCity, M0, S5 1.80 Lartonville, Ill, A7 1.73 Lartonville, Ill, A7 1.73 Lartonville, Ill, A7 1.73 Lartonville, Ill, A7 1.75 Lartonville, Ill, K4 10.36 Lartonville, Ill, K4 1	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b, mill) BOLTS Machine Boits Full Size Body (cut thread) in. and smaller 3 in. and shorter . 55.0 3% in. thru 6 in 50.0 Longer than 6 in 37.0 in. 3 in. & shorter 47.0 % in. thru 6 in 40.0 Longer than 6 in 31.0 Longer than 6 in 31.0 in. thru 1 in.: 6 in. and shorter . 37.0 Longer than 6 in 31.0 Longer than 6 in 31.0 Longer than 6 in 30.0 in. thru 1 in.: 6 in. and shorter . 37.0 Longer than 6 in 30.0 Carriage Body (rolled thread) in. and smaller: 3 in. and smaller: 3 in. and shorter . 55.0 Carriage Body (cut thread) & Undersize Body (rolled thread) in. and smaller: 6 in. and shorter . 48.0 Larger diameters and longer lengths 35.0 Lag. Plow, Tap. Blank, Step. Elevator. Tire, and Fitting Up Bolts in. and smaller: 6 in. and shorter . 48.0 Larger diameters and Fitting Up Bolts in. and smaller: 6 in. and shorter . 48.0 Larger diameters and Sitting Up Bolts in. and smaller: 6 in. and shorter . 48.0 Larger diameters and Fitting Up Bolts in. and smaller: 6 in. and shorter . 48.0 Larger diameters and shorter . 48.0 Larger diameter shorter . 48.0 Larger diameter shorter . 48.0 Larger diameter shorter . 48.0 Larger diamete	Gary Ind. U5 Huntington, W. Va. C15 Johnstown, Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steelton, Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala, T2 6.875 Gary, Ind. U5 6.875 Gary, Ind. U5 6.875 Minnequa, Colo. C10 7.025 Steelton, Pa. B2 7.025 Steelton, Pa. B2 6.875 Torrance, Calif. C11 6.875 JOINT BARS Bessemer, Pa. U5 7.25 Fairfield, Ala, T2 7.25 Joliet, Ill. U5 7.25 Lackawanna, N. Y. B2 7.25 Joliet, Ill. U5 7.25 Steelton, Pa. B2 7.25 Johnstown, Pa. B2 7.25 Minnequa, Colo. C10 7.25 Steelton, Pa. B2 7.25 AXLES Ind. Harbor, Ind. S13 9.125 Johnstown, Pa. B2 9.125 Footnotes (1) Chicago base, (2) Angles, flats, bands, (3) Merchant, (4) Reinforcing, (6) Life to under 1.7/16 in.; 17/16 to under 1.7/16 in.; 17/16 to under 1.7/16 in.; 17/16 to under 1.7/16 in.; 16/16 to 8 in.; inclusive, 7.050. (Chicago or Bim base, (7) Chicago precial quality; add 6.350 for gase 0.142 and lighter, 5.80c. (11) Gergan 0.142 and lighter, 5.80c. (15) % and thinner, (16) 40 lb and under	5.75 5.65 TRACK BOLYS, Untreated Cleveland R2 SamsasCity, Mo. S5 Lebanon.Pa. B2 SCREW SPIKES Lebanon.Pa. B2 STANDARD TRACK SPIKES Fairfield.Ala. T2 Ind. Harbor.Ind. I-2,Y1 10 KansasCity, Mo. S5 Lebanon.Pa. B2 SCREW SPIKES Lebanon.Pa. B2 STANDARD TRACK SPIKES Fairfield.Ala. T2 Ind. Harbor.Ind. I-2,Y1 10 KansasCity.Mo. S5 Clebanon.Pa. B2 10 Minnequa.Colo. C10 Gentlebard. Ind. I-2,Y1 10 KansasCity.Mo. S5 Clebanon.Pa. B2 10 Minnequa.Colo. C10 Schieago.Ill. R2 Struthers.O. Y1 (25) Bar mill bands. (26) Deld. in mill zone, 6.295 Call Widths over % in.; 7.37 for widths % in. and unby 6.125 in. and thinner, (32) Buffalo base. (33) To jobbers, deduct 20c. (34) 9.80c for cut lengths. (37) Chicago base, in poblower. (38) 14 Gs. & lighter; 48" narrower. (36) 14 Gs. & lighter; 48" narrower. (37) 48" and narrower. (38) 48" and narrower.
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	OLISHED STREES Col. LabamaCity, Ala, R.2 1.75 Liquippa, Pa, J5 1.73 Liquippa, Pa, J5 1.73 Liquippa, Pa, J5 1.73 Litanta Al 1 1.77 Lartonville, Ill. K4 1.77 Lartonville, Ill. M8 1.77 Lartonville, Ill. A7 1.73 LansasCity, Mo. S5 1.80 Lartonville, Ill. A7 1.73 Lartonville, Ill. C1 1.94 Lartonville, Ill. C1 1.94 Lartonville, Ill. C7 N.15 Lartonville, Ill. C7 N.15 Lartonville, Ill. C7 N.15 Lartonville, Ill. C8 Lartonville, Ill. C8 Lartonville, Ill. C8 Lartonville, Ill. C8 Lartonville, Ill. M8 10.36 Lartonville, Ill. A7 10.26 Lartonville, Ill. A8 10.36 Lartonville, Ill. A7 10.26 Lartonville, Ill. A7 10.26 Lartonville, Ill. A7 10.36 Lartonville, Ill. A7 10.70 Lartonville, Ill. A	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill) BOLTS Machine Boits Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter . 55.0 3½ in. thru 6 in 37.0 % in., 3 in. & shorter 47.0 % in., 3 in. & shorter 47.0 1½ in. thru 6 in 31.0 Longer than 6 in 50.0 Longer than 6 in 50.0 Longer than 6 in 50.0 Carriage Body (rolled thread) ½ in. and smaller: 3 in. and shorter . 55.0 3¼ in. thru 6 in 50.0 Carriage Botts Full Size Body (cut thread) & Undersize Body (rolled thread) ½ in. and smaller: 6 in. and shorter . 48.0 Larger diameters and longer lengths 35.0 Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Boits ½ in. and smaller: 6 in. and shorter . 48.0 Larger diameters and longer lengths 35.0 Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Boits ½ in. and smaller: 6 in. and shorter . 48.0 Larger diameters and longer lengths 35.0 Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Boits ½ in. and smaller: 6 in. and shorter . 48.0 Larger diameters and longer lengths	Gary Ind. U5 Huntington, W. Va. C15 Johnstown. Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steetton. Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2	5.75 5.65
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	OLISHED STREES Col. LabamaCity, Ala. R.2 1.75 Liquippa, Pa. J5 1.73 Liquippa, Pa. J5 1.73 Liquippa, Pa. J5 1.73 Liquippa, Pa. J5 1.73 Litanta Al 1 1.77 Lartonville, Ill. K4 1.77 Lartonville, Ill. K3 1.73 Lartonville, Ill. M8 1.77 Lartonville, Ill. M8 1.77 Lartonville, Ill. A7 1.73 Lartonville, Ill. C1 1.94 Lartonville, Ill. C1 1.94 Lartonville, Ill. C1 1.94 Lartonville, Ill. C7 1.75 Lartonville, Ill. C7 1.75 Lartonville, Ill. C7 1.75 Lartonville, Ill. K4 10.36 Lartonville, Ill. K4 10.36 Lartonville, Ill. K4 10.36 Lartonville, Ill. K4 10.36 Lartonville, Ill. K8 10.36 Lartonville, Ill. K9 10.60 Lartonville, Ill. K9 10.6	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill) BOLTS Machine Boits Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter . 55.0 3½ in. thru 6 in 37.0 5% in., 3 in. & shorter 47.0 ½ in. and shorter . 31.0 ½ in. thru 6 in 31.0 ½ in. thru 1 in.; 6 in. and shorter . 37.0 ½ in. and shorter . 37.0 Longer than 6 in 31.0 ½ in. thru 1 in.; 6 in. and shorter . 37.0 Longer than 6 in 31.0 ½ in. and smaller: 3 in. and smaller: 3 in. and smaller: 3 in. and smaller: 4 in. and smaller: 6 in. and shorter . 55.0 Carriage Bots Full Size Body (cut thread) & Undersize Body (rolled thread) ½ in. and smaller: 6 in. and shorter . 48.0 Larger diameters and longer lengths 35.0 Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Boits ½ in. and smaller: 6 in. and shorter . 48.0 Larger diameters and longer lengths 35.0 Ligh Tensile Structural Boits (Reg. semifinished hex head boits, standard heavy double chamfered hex nuts. Bolts — High-carbon steel, heat treated, Spec. ASTM A-325, in bulk, Full keg quantity) 5% in. diam 50.0 % in. diam 50.0 % in. diam	Gary Ind. U5 Huntington, W. Va. C15 Johnstown, Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steetton, Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2	5.75 5.65
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	Olished Stapeles Col. LabamaCity, Ala, R2 175 Liquippa, Pa, J5 173 Liquippa, Pa, J5 173 Liquippa, Pa, J5 173 Litanta Al 1 177 Lartonville, Ill, K4 177 Lartonville, Ill, K3 177 Lartonville, Ill, K3 177 Lartonville, Ill, K4 177 Lartonville, Ill, K4 177 Lartonville, Ill, K7 173 Lartonville, Ill, K7 173 Lartonville, Ill, K1 174 Lartonville, Ill, K1 175 Lartonville, Ill, K7 175 Lartonville, Ill, K4 10.36 Lartonville, Ill, K4 10.70 Lartonville, Ill,	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill) BOLTS Machine Bolts Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter 55.0 3½ in. thru 6 in 30.0 Longer than 6 in 31.0 ½ in. thru 6 in 40.0 Longer than 6 in 31.0 ½ in. thru 1 in.: 6 in. and shorter 37.0 ½ in. and shorter 31.0 ½ in. thru 1 in.: 8 in. and shorter 31.0 Longer than 6 in 31.0 ½ in. and shorter 31.0 ½ in. and shorter 31.0 ½ in. and shorter 31.0 ½ in. and smaller: 3 in. and smaller: 6 in. and shorter 55.0 Carriage Bolts Full Size Body (cut thread) & Undersize Body (rolled thread) ½ in. and smaller: 6 in. and shorter 48.0 Larger diameters and longer lengths 35.0 Lag. Plow, Tap. Blank, Step. Elevator, Tire, and Fitting Up Bolts ½ in. and smaller: 6 in. and shorter 48.0 Larger diameters and longer lengths 35.0 Larger diameters and solute, Full keg examifnished hex head bolts, standard heavy double chamfered hex nuts. Bolts — High-carbon steel, heat treated, Spec. ASTM A-325, in bulk. Full keg quantity) ½ in. diam 50.0 ½ in. diam 47.0 ½ and 1 in. diam 43.0 1½ and 1½ in. diam 43.0 1½ and 1½ in. diam 43.0	Gary Ind. U5 Huntington, W. Va. C15 Johnstown. Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steetton. Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala. T2	5.75 5.65 TRACK BOLYS, Untreated Cleveland R2 TRACK BOLYS, Untreated R2 TRACK
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	OLISHED STREES Col. LabamaCity, Ala. R2 1.75 Liquippa, Pa. J5 1.73 Liquippa, Pa. J5 1.77 Liquippa, Pa. J6 Liquippa, Pa. J6 Liquippa, Pa. J7 L	Birmingham C15	(Base discounts, shipments of one to four containers, per cent off list, f.o.b, mill) BOLTS Machine Boits Full Size Body (cut thread) ½ in. and smaller 3 in. and shorter	Gary Ind. U5 Huntington, W. Va. C15 Johnstown, Pa. B2 Lackawanna, N. Y. B2 Minnequa, Colo. C10 Steelton, Pa. B2 Williamsport, Pa. S19 TIE PLATES Fairfield, Ala, T2 6.875 Gary, Ind. U5 6.875 Gary, Ind. U5 6.875 Minnequa, Colo. C10 7.025 Steelton, Pa. B2 7.025 Steelton, Pa. B2 6.875 Torrance, Calif. C11 6.875 JOINT BARS Bessemer, Pa. U5 7.25 Fairfield, Ala, T2 7.25 Joliet, Ill. U5 7.25 Steelton, Pa. B2 7.25 Joliet, Ill. U5 7.25 Steelton, Pa. B2 7.25 Minnequa, Colo. C10 7.25 Steelton, Pa. B2 7.25 Minnequa, Colo. C10 7.25 Steelton, Pa. B2 7.25 Minnequa, Colo. C10 7.25 Minnequa, Colo. C10 7.25 Steelton, Pa. B2 7.25 Minnequa, Colo. C10 7.25 Steelton, Pa. B2 7.25 Minnequa, Colo. C10 7.25 C10 Lingso base, C10 Lingso base, C11 Chicago base, C12 Angles, flats, bands, C13 Merchant, C15 Merchant, C16 Merchant quality; add 6.350 for special quality; add 6.350 for specia	5.75 5.65 (16)8. 5.75 5.65 6. 5.75 5.65 7. 5.75 5.65 6. 5.75 5.65 7. 5.75 5.65 6. 5.75 5.65 7. 5.75 5.65 7. 5.75 5.65 6. 5.75 5.65 7. 5.75 5.65 5. 5.75 5. 5.75 5. 5.75 5.65 5. 6. 5.75 7

	2 2 37c 58. 3.68 5. Galv* Blk + 28.75 + 5.75 + 5.75 + 5.75 + 5.75	76 82 76 82 78 82 81 7 81k + 23.5 + 3.25 + 3.25 + 3.25 + 3.25	+1.75 +21 +1.75 +19.5	\$1.09 10.89	\$1.48 14.81 Bik Galv* +2 +19.75 +2 +2 +19.75 +2 +19.75	\$1.92 19.18 Blk Galv* 0.5 +17.25 0.5 +17.25 0.5 +17.25
LECTRICWELD STANDA Youngstown R2+ 12.25			Carload discounts + 21 + 1.75 + 19.5	from list, % +1.75 +19.5	+2 +19.75	0.5 + 17.25
List Per Ft Pounds Per Ft Liquippa, Pa, J5 Alton, Ill. L1 Senwood, W. Va. W10 L15 Sutler, Pa. F6 L16 L17 L17 L18 L18 L19 L18 L19	1/6 5.5c 0.24 0.24 0. Galv* 10.5 +27 +10.5 +24 +8.5 +24 +8.5 +24 +8.5	14 6c 42 42 42 42 42 42 42 42 42 42 42 42 42	Carload discounts: %	from list, % 11.5c 1.13 Blk Galv* 5.25 + 11 3.25 + 13 5.25 + 11 3.25 + 13 4.7.75 + 24 4.25 + 12 5.25 + 11 5.25 + 11 3.25 + 13 5.25 + 11 5.25 + 11 5.25 + 11 5.25 + 11 5.25 + 11	1 17c 1.68 Blk Galv* 8.75 + 6.5 6.75 + 8.5 8.75 + 6.5 6.75 + 8.5 4.25 + 19.5 7.75 + 7.5 8.75 + 6.5 6.75 + 8.5 4.25 + 19.5 7.75 + 7.5 8.75 + 6.5 8.75 + 6.5 8.75 + 6.5 8.75 + 6.5 8.75 + 6.5	1¼ 230 2.28 Blk Galv* 11.25 +5.25 9.25 +7.28 11.25 +5.25 9.25 +7.25 11.25 +5.25 1.25 +7.25 11.25 +5.25 10.25 +7.75 11.25 +5.25 11.25 +5.25 11.25 +5.25 11.25 +5.25 11.25 +5.25
Size—Inches List Per Ft Pounds Per Ft Aliquippa, Pa. J5 Alton, Ill. L1 Benwood, W. Va. W10. Etna, Pa. N2 Fairless, Pa. N3 Fontana, Calif. K1	1½ 27.5c 2.72 Blk Galv* 11.75 +4.25 9.75 +6.25 11.75 +4.25 11.75 +4.25 11.75 +4.25 11.75 +4.25 11.75 +6.25 +1.25 +17.25	2 37c 3.68 Blk Galv* 12.25 +3.75 10.25 +5.75 12.25 +3.75 12.25 +3.75 10.25 +5.75 +0.75 +16.75	2 ½ 58.5c 5.82 Blk Galv* 13.75 + 3.5 11.75 + 5.5 13.75 + 3.5 11.75 + 5.5 11.75 + 5.5 0.75 + 16.5 12.75 + 4.5	3 76.5e 7.62 Blk Galv* 13.75 + 3.5 11.75 + 5.5 13.75 + 3.5 11.75 + 5.5 0.75 + 16.5 12.25 + 4.5	3 ½ 92c 9.20 Blk Galv* 1.25 + 16.5 3.25 + 14.5 1.25 + 14.5 1.25 + 16.5 2.25 + 15.5	\$1.09 10.89 Blk Galv* 1.25 + 16.5 3.25 + 14.5 3.25 + 14.5 1.25 + 16.5 +9.75 + 27.5 2.25 + 15.5

Benwood, W. Va. W10.
Etna, Pa. N2
Fairless, Pa. N3
Fontana, Calif, K1
Indiana Harbor, Ind. Y1
Lorain, O. N3
Sharon, Pa. M6
Sparrows Pt., Md. B2.
Wheatland, Pa. W9
Youngstown R2, Y1 12.75 13.75 13.75 11.75 +4.5 +3.5 +3.5 +**5.5** 12.25 13.75 13.75 11.75 +3.5 + 6.25 + 4.25 10.25 12.25 11.75 +4.2512.25 +3.75

11.25

12,25

+4.75 +3.75

+3.75

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

*Galvanized pipe discounts based on current price of zinc (11.50c, East St. Louis).

10.75 11.75

11.75

+5.25 +4.25 +4.25

AISI Type		-Rero	olling Slabs	Forg- ing Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Struc- tural Shapes	Plates	Sheets	C.R. Strip; Flat Wire	1
1		22.00	27.00		36.00	40.00	42.00	39.25	48.50	45.00	
1		23.75	30.25	36.50	39.00	40.75	43.00	40.00	49.25	49.25	
		23.25	28.00	37.25	37.25	42.00	44.25	41.25	51.25	47.50	
		25.25	31.50	38,00	40.50	42.75	45.00	42.25	52.00	52.00	
302B		25.50	82.75	40.75	45.75	45.00	47.25	44.50	57.00	57.00	
000			32.00	41.00	46.00	45.50	48.00	45.00	56.75	56.75	
		27.00	83.25	40.50	44.25	45.25	47.75	45.75	55.00	55.00	
304L				48.25	51.50	53.00	55.50	53.50	63.25	63.25	
		28.50	86.75	42.50	47.50	45.25	47.75	46.25	58.75	58.75	
		30.75	38.25	47.25	50.25	52.75	55.75	55.25	63.00	63.00	
1		39.75	49.50	57.75	64.50	63.75	67.00	66.00	80.50	80.50	
		49.75	61.50	78.00	84.25	86.50	91.00	87.75	96.75	96.75	
1		10.10	02100	77.50		86.50	91.00	87.75	99.00	104.25	
50		39.75	49.50	62.25	69.25	69.25	73.00	71.75	80.75	80.75	
316L			55.50	70.00	76.50	77.00	80.75	79.50	89.25	89.25	
		48.00	60.00	76.75	88.25	86.25	90.75	88.50	101.00	101.00	
		32.25	40.00	47.00	53.50	52.50	55.50	54.75	65.50	65.50	
000				118.75		132.00	138.50	135.50	149.25	149.25	
	CbTa	37.00	46.50	55.75	63.50	61.50	64.75	64.75	79.25	79.25	1
				28.25		32.00	33.75	30.00	40.25	40.25	
4		19.50	25.50	29.75	36.00	33.50	35.25	32.50	46.75	46.75	
		16.75	21.50	28.25	31.00	32.00	33.75	30.00	40.25	40.25 48.25	
1				28.75		32.50	34.25	31.25	48.25	62.00	
1		26.00	33.50	34.25	41.75	39.25	41.25	40.25	62.00	40.75	
		17.00	21.75	28.75	32.00	32.50	34.25	31.00	40.75	51.75	
430F				29.50		33.00	34.75	31.75	51.75	56.00	
			28.75	37.75	****	42.00	44.25	41.00	56.00 70.00	70.00	
446 .				39.25	59.00	44.25	46.50	42.75	10,00	, 0.00	

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armeo Steel Corp.; Babcock & Wileox Co.; Bethlehem Steel Co.; J. Bishop & Co.; Armeo Steel Corp.; Babcock & Wileox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Dearborn Div., Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Corp.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Superior Tube Co.; Superior Steel Simonds Saw & Steel Co.; Superior Tube Co.; Subsidiary of Crucible Steel Co.; Frent Tube Co.; Subsidiary of Crucible Steel Co.; Wallingford Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Corp.; Vanadium-Alloys Steel Corp., Washington Steel Corp.

Clad Steel

+4.5+3.5

		——Pla	tes—— n Base		Sheets Carbon Base
Stainless	5%	10%	15%	20%	20 %
302 304 304L 316 316 316C 321 347 405 410 430 Inconel Nickel Nickel, Low Carbon	26.05 30.50 38.20 42.30 49.90 31.20 36.90 22.25 20.55 21.20 48.90 41.65 41.95	28.80 33.75 42.20 46.75 55.15 34.50 40.80 22.70 23.45 59.55 51.95 52.60 53.55	31.55 36.95 46.25 51.20 60.40 37.75 44.65 26.90 24.85 25.65 70.15 63.30 63.30 63.80	34.30 40.15 50.25 55.65 65.65 41.05 48.55 29.25 27.00 27.90 80.85 72.70 74.15	37.50 39.75 58.25 47.25 57.00
Monel	43.35	ບວ.ຍບ	00,00		Carbon Base

1.25 + 16.5 9.75 + 27.5 2.25 + 15.5

1.25 + 16.53 25

-Cold Rolled-

1.25 + 16.5 + 9.75 + 27.5 2.25 + 15.5

1.25 + 16.5 3.25 + 14.5 3.25 + 14.5

34.75

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Wash-ington, Pa. J3, nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

 Grade
 \$ per lb
 Grade
 \$ per lb

 Reg. Carbon (W-1)
 0.330
 W-Cr Hot Work (H-12)
 0.530

 Spec. Carbon (W-1)
 0.355
 V-Cr Hot Work (H-13)
 0.550

 Oil Hardening (O-1)
 0.505
 W Hot Wk. (H-21)
 1.425-1.44

 V-Cr Hot Work (H-11)
 0.505
 Hi-Carbon-Cr (D-11)
 0.955

	Grade by	Analys	is (%) —		AISI	
W	Cr	V	Co	Mo	Designation	\$ per lb
18	4	1			T-1	1.840
18	4	2			T-2	2.005
13.5	4	3			T-3	2.105
18.25	4.25	1	4.75		T-4	2.545
18	4	2	9		T-5	2.915
20.25	4.25	1.6	12.95		T-6	4.330
13.75	3.75	2	5		T-8	2.485
1.5	4	1		8.5	M-1	1.200
6.4	4.5	1.9		5	M-2	1.345
6	4	3		6	M-3	1.590
Tool	_	roduce	s includ	e: A4,	A8, B2, B8,	C4, C9,
C12 C	18. F2.	J3. L3	, M14,	58, U4,	V2, and V3.	
1024,0	,,		,			

193 December 15, 1958

Pig Iron F.o.b. furnace	prices in doll	ars per gr	oss ton, a	s reported to Steel. Minimum delivered prices are approximate.
	No.		Besse-	No. 2 Malle- Bes
Birmingham District	Basic Found		mer	Basic Foundry able mo
Birmingham R2	62.00 62.5)**		Duluth I-3 66.00 66.50 66.50 67. Erie, Pa, I-3 66.00 66.50 66.50 67.
Birmingham U6	62.5	0** 66.50		Everett, Mass. E1 67.50 68.00 68.50
Woodward, Ala. W15 Cincinnati, deld.	62.50* 62.50			Fontana, Calif. K1
	10.2		,	GraniteCity,Ill, G4 67.90 68.40 68.90
Buffalo District				Ironton, Utah C11 66.00 66.50 Minnequa, Colo. C10 68.00 68.50 69.00
Buffalo H1, R2 N. Tonawanda, N.Y. T9	86 51		67.50 67.50	Rockwood, Tenn. T3 62.50‡ 66.50
Ionawanga, N.Y. W12	66.00 65.5	67.00	67.50	Toledo, Ohio I-3
Boston, deld	69.02 69.53			
Syracuse, N.Y., deld.	70.12 70.62			*Phos. 0.70-0.90%; Phos. 0.30-0.69%, \$63. **Phos. 0.70-0.90%; Phos. 0.30-0.69%, \$63.50.
Chicago District				‡Phos. 0.50% up; Phos. 0.30-0.49, \$63.50.
Chicago I-3	66.00 66.50	66.50	67.00	DIG IDAN DIFFERENCIALS
S.Chicago,Ill. R2 S.Chicago,Ill. W14	66.00 66.50		67.00 67.00	PIG IRON DIFFERENTIALS
Milwaukee, deld	69.02 69.52	69.52	70.02	Silicon: Add 75 cents per ton for each 0.25% Si or percentage there over base grade, 1.75-2.25%, except on low phos. iron on which be
Muskegon, Mich., deld	74.52	74.52		is 1.75-2.00%.
Cleveland District				Manganese: Add 50 cents per ton for each 0.25% manganese over 1 or portion thereof.
Cleveland R2, A7	66.00 66.50		67.00	
Akron, Ohio, deld.	69.52 70.02	70.02	70.52	BLAST FURNACE SILVERY PIG IRON, Gross Ton
Mid-Atlantic District				(Base 6.00-6.50% silicon; add \$1 for each 0.50% silicon or port# thereof over the base grade within a range of 6.50 to 11.50%; start#
Birdsboro,Pa. B10 Chester,Pa. P4	68.00 68.50		69.50	with silicon over 11.50% and \$1.50 per ton for each 0.50% silicon
Swedeland, Pa. A3	68 00 68 50		69.50	portion thereof up to 14%; add \$1 for each 0.50% Mn over 1%) Jackson,Ohio I-3, J1
NewYork, deld. Newark, N.J., deld.	72.69 73.19			Buffalo H1 79.
Philadelphia, deld.	70.41 70.91		74.19 71.99	ELECTRIC FURNACE SILVERY IRON, Gross Ton
Troy, N.Y. R2	68.00 68.50	69.00	69.50	(Base 14.01-14.50% silicon; add \$1 for each 0.5% Si to 18%; \$1.25 ft
Pittsburgh District				each 0.50% Mn over 1%; \$2 per gross ton premium for 0.045% max
NevilleIsland,Pa. P6	66.00 66.50	66.50	67.00	CalvertCity, Ky. P15 \$99. NiagaraFalls, N.Y. P15 99.
Aliquippa, deld	67.95	67.95	68.48	Keokuk, Iowa Open-hearth & Fdry, \$9 freight allowed K2, 103.
McKeesRocks, Pa., deld, Lawrenceville, Homestead,	67.60	67.60	68.13	Keokuk, Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to \$9, K2
Wilmerding, Monaca, Pa., deld	68.26	68.26	68.79	
Verona, Trafford, Pa., deld Brackenridge, Pa., deld	68 60 60 10	68.82 69.10	69.35	LOW PHOSPHORUS PIG IRON, Gross Ton
Midland, Pa. C18	66.00	69.10	69.63	Lyles, Tenn. T3 (Phos. 0.035% max)
Youngstown District				Troy, N.Y. R2 (Phos. 0.035% max)
Hubbard, Ohio Y1		66.50		Philadelphia, deld
Youngstown Y1	66.00	66.50	67.00	Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max) 71.
Mansfield, Ohio, deld.	71.30	$66.50 \\ 71.80$	72.30	Erie, Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max) 71. Neville Island, Pa. P6 (Intermediate) (Phos. 0.036-0.075% max) 71.
				.,

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denve Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spoka San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

		SH	EETS-		STRIP		BARS				
	Hot- Rolled	Cold-	Galv.	Stainless	Hot-	H.R.	BAKS-	H.R. Alloy	Standard Structural	PLA	TES
Atlanta	8.59§	Rolled	10 Ga.†	Type 302	Rolled*	Rounds	C.F. Rds.‡	4140††5	Shapes	Carbon	Floor
Baltimore	-	9.86§	10.13		8.91	9.39	13.24 #		9.40	9.29	11.21
Birmingham	8.55 8.18	9.25	9.99		9.05	9.45	11.85#	15.48	9.55	9.00	10.50
Boston	9.31	9.45 10.40	10.46 11.39	****	8.51	8.99			9.00	8.89	10.99
Buffalo	8.40	9.60	10.85	53.50 55.98	9.73	10.11	13.39 #	15.71	10.01	10.02	11.85
Chattanooga	8.35	9.69	9.65		8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chicago	8.25	9.45	10.50	53.00	8.40 8.51	8.77	10.46		8.88	8.80	10.66
Cincinnati	8.43	9.51	10.55	53.43	8.83	8.99 9.31	9.15 11.53 #	15.05	9.00	8.89	10.20
Cleveland	8.36	9.54	10.65	52.33	8.63	9.10	11.25 #	15.37 15.16	9.56 9.39	9.27 9.13	10.53 10.44
Dallas	8.80	9.30			8.85	8.80			8.75		
Denver Detroit	9.40	11.84	12.94		9.43	9.80	11.19		9.84	9.15 9.76	10.40 11.08
	8.51	9.71	10.87	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa	8.20	9.45	9.9510		8.60	9.10	11.25		9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss	8.52	9.79			8.84	9.82	10.68				
Los Angeles	8.702	10.802	12.152	57.60	9.15	9.102	12.952	10.05	9.33	9.22	11.03
Memphis, Tenn.	8.59	9.80			8.84	9.32		16.35	9.002	9.10^{2}	11.302
Milwaukee	8.39	9.59	10,64		8.65	9.32	11.25 # 9.39	15.19	9.33	9.22	10.86
Moline, III	8.55	9.80			8.84	8.95	9.15	15.19	9.22 8.99	9.03 8.91	10.34
New York Norfolk, Va	8.87	10.13	11.10	53.08	9.64	9.99	13.25#	15.50	9.74		
	8.40				9.10	9.10	12.00	10.00	9.40	9.77 8.85	11.05 10.35
Philadelphia Pittsburgh	8.20 8.35	9.25	11.34	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	
Richmond, Va.		9.55	10.90	52.00	8.61	8.99	11.25#	15.05	9.00	8.89	10.40** * 10.20
	8.40	* * * *	10.40		9.10	9.00			9.40	8.85	10.35
St. Louis St. Paul	8.63 8.79	9.83	10.88		8.89	9.37	9.78	15.43	9.48		
San Francisco	9.65	10.04 11.10	11.09	22122	8.84	9.21	9.86	10.10	9.38	9.27 9.30	10.58 10.49
Seattle	10.30	11.55	11.00 12.50	55.10 56.52	9.75	10.15	13.00	16.00	9.85	10.00	12.35
South'ton, Conn.	9.07	10.33	10.71	50.52	10.25 9.48	10.50	14.70	16.803	10.20	10.10	12.50
Spokane	9.95	11.55	12.50	57.38	10.55	9.74 10.65	14.70	10.00	9.57	9.57	10.91
Washington	9.15			• • • •	9.65		14.70	16.80	9.80	9.70	12.10
				* * * *	0.00	10.05	12.50		10.15	9.60	11 10

^{*}Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **1% includes; ††% in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; 2—30,000 lb; 3—1000 to 4999 lb; 5—1000 to 1999 lb; 10—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., \$140; Salina, Pa., \$145; Niles, Ohio, \$138; Cutler, Utah, \$165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, \$185; Stevens Pottery, Ga., \$195; Cutler, Utah, \$233.

Silica Brick (per 1000)

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., \$158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., \$163; E. Chicago, Ind., Joliet, Rockdale, Ill., \$168; Lehigh, Utah, \$175; Los Angeles, \$180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., \$157; Morrisville, Hays, Latrobe, Pa., \$168; E. Chicago, Ind., \$167; Curtner, Calif., \$182.

Semisilica Brick (per 1000)

Semisilica Brick (per 1000)

Clearfield, Pa., \$140; Philadelphia, \$137; Woodbridge, N. J., \$135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, \$96.75; Clearfield, Pa., Portsmouth, Ohio, \$102.

High-Alumina Brick (per 1000)

50 Per Cent: St. Louis, Mexico, Vandalia, Mo., \$235; Danville, Ill., \$253; Philadelphia, Clear-

field, Pa., \$230; Orviston, Snow Shoe, Pa., \$260.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., \$295; Danville, Ill., \$313; Clearfield, Orviston, Snow Shoe, Pa., \$320; Philadelphia, \$310.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., \$335; Danville, Ill., \$353; Clearfield, Orviston, Snow Shoe, Pa., \$360; Philadelphia, \$350. \$260

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, \$188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, \$310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., \$234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, \$16.75; Thornton, McCook, Ill., \$17; Dolly Siding, Bonne Terre, Mo., \$15.60.

Magnesite (per net ton)

Domestic, dead - burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., \$46; % in. grains with fines: Baltimore, \$73.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF₂ content 72.5%, \$37-\$41; 70%, \$36-\$40; 60%, \$33-\$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade: European, \$30-\$33, contract; Mexican, all rail, duty paid, \$25; barge, Brownsville, Tex., \$27.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

Sponge Iron, Swedish:
deld. east of Mississippl River, ocean bags
23,000 lb and over. 10.50
F.o.b. Riverton or
Camden, N. J., west
of Mississippi River. 9.50

Sponge Iron, Domestic, 99 + % Fe: Deld. east of Mississippi River, 23,000 lb and over 10.50

Annealed, 99.5% Fe.. 36.50

Fe) (minus 325 mesh) 59.00
Powder Flakes (minus

16, plus 100 mesh). 29.00 Carbonyl Iron: 98.1-99.9%, 3 to 20 mi-98.1-99.9%, 3 to 20 mi-crons, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh

Atomized, 500-lb Brass, 5000-lb lots 42.00* lots33.00-48.90† Bronze, 5000-lb

lots49.60-53.70† Copper:

Copper (atomized) 5000lb lots ... 42.30-50.80†
Silicon ... 47.50
Solder ... 7.00*
Stainless Steel, 304 ... \$1.07
Stainless Steel, 316 ... \$1.26
Tin ... 14.00*

Zinc, 5000-22 Tungsten: Melting grade, 99% 60 to 200 mesh, Dollars

Melting grade, 99%
60 to 200 mesh,
nominal:
1000 lb and over ... 3.15
Less than 1000 lb... 3.30
Chromium, electrolytic
99.8% Cr, min
metallic basis ... 5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

		Dan
Inch		Per
Diam	Length	100 lb
2	24	\$64.00
21/2	30	41.50
3	40	39.25
4	40	37.00
5%	40	36.50
6	60	33.25
6 7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25
	CARRON	

	CARBON	
8	60	14.25
10	60	13.80
12	60	14.75
14	60	14.75
14	72	12.55
17	60	12.65
17	72	12.10
20	90	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35,	40 110	11.60
40	100	12.50

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.) South Gulf Manda

	Atlantic	Atlantic	Coast	Coast
To a Total Telementation ACTIVE A 205	\$5.10	\$5.10	\$5.00	\$5.45
Deformed Bars, Intermediate, ASTM-A 305	5.00	5.00	4.90	5.33
Bar Size Angles	5.00	5.00	4.90	5.33
Structural Angles	5.06	5.06	4.96	5.40
I-Beams	5.06	5.06	4.96	5.40
Channels		6.62	6.62	6.94
Plates (basic bessemer)	6.62	8.20	8.20	8.50
Sheets, H.R.	8.20	8.20 8.75	8.75	9.12
Sheets C.R. (drawing quality)	8.75	9.19	0.10	0.12
Furring Channels, C.R., 1000 ft, % x 0.30 lb		0 2 20	07 50	26.46
per ft	20.11	25.59	25.59	7.00
Barbed Wire (†)	0.00	6.65	6.65	5.90
Merchant Bars	5.40	5.40	5.35	
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.15	5.28	5.10	5.45
Wire Rods, O.H. Cold Heading Quality No. 5	6.05	6.18	6.00	6.30
Wire Rods, O.H. Cold Heading Quanty 1101	7.89	7.75	7.67	8.26
Bright Common Wire Nails (§)				

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective for the 1958 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer \$11.60

Mesabi nonbessemer 11.45
Old Range bessemer 11.45
Old Range nonbessemer 11.70
Open-hearth lump 12.70
High phos 11.45
The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore
Cents per unit, deld. E. Pa.
New Jersey, foundry and basic 62-64%
concentrates 18.00-19.00

Foreign Iron Ore
Cents per unit, c.i.f. Atlantic ports
Swedish basic, 65% 23.00
N. African hematite (spot) nom
Brazilian iron ore, 68.5% 26.00

Tungsten Ore
Net ton, unit

Foreign wolframite, good commercial
quality \$12.25-\$12.50*
Domestic, concentrates f.o.b. milling
points 16.00-17.00† gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian (export tax included)
\$1.10 per long ton unit, c.i.f. U. S. ports,
duty for buyer's account; other than Indian,
nominal; contracts by negotiation.
Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

 Oreg., Tacoma, Wash.
 Indian and Rhodesian

 48% 3:1
 \$42.00-44.00

 48% 0.8:1
 38.00-40.00

 48% no ratio
 29.00-31.00

 South African Transvaal
 22.00-23.00

 48% no ratio
 29.00-31.00

 Turkish
 51.00-55.00

Domestic

Metallurgical Coke

*Or within \$5.15 freight zone from works.

Coal Chemicals

Effective: *Apr. 12; †July 1; ‡July 8; Aug. 12; **Nov. 4.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, \$105; 19-21% Mn, 1-3% Si, \$102.50; 16-19% Mn, \$100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, \$245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Shefield, Ala.; Portland, Oreg. Add or subtract \$2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively. (Mn 79-81%). Lump \$253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add \$2.60 for each 1% above 81%; subtract \$2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. Special Grade: (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silcomaganese: (Mn 65-68%). Carload, lump, bulk 1,50% C grade, 18-20% Si, 12.8c per lb of alloy, Packed, cl. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Orge. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max. Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, \$1.50 per lb of contained Ti; less ton to 300 lb, \$1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot \$1.35, less ton to 300 lb \$1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. \$240 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, \$245.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. \$290 per ton, f.o.b. Niagara Falis, N. Y., freight not exceeding St. Louis rate allowed. Spot, \$295.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c; less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.

Cr 67-71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 61-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 30.8c per lb of contained Cr. Packed, cl. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload packed, 8M x D, 21.25c per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si, 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade, (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ½" thick) \$1.15 per lb, ton lot \$1.17. less ton lot \$1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, \$3.20 per lb of contained V. Delivered, Spot, add 10c. Special Grade: (V 50-55% or 70-75%, Si 2% max, C 0.5% max) \$3.30. High Speed Grade: (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) \$3.40.

Grainal: Vanadium Grainal No. 1 \$1.05 per lb; No. 79, 50c, freight allowed.

SILICON ALLOYS

50% Ferrosilicon: Contract, carload, lump, bulk, 14.6c per lb of contained Sl. Packed c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c,

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 169c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump bulk. 20c per lb of contained Si. Packed, c.1 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Sl, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Sl. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing min 98.25% min Sl.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, \$1.20 per lb of alloy; less than 100 lb \$1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) \$1.20; Grade C (19% min B) \$1.50.

Borosil: (3 to 4 % B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, \$5.25 per lb of contained B. Packed, carload \$5.40, ton to c.l. \$5.50, less ton \$5.60. Delivered.

Carbortam: (B 1 to 2%). Contract, lump, carload \$320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, I 14-18% and Si 53-59%) Contract, carlos lump, bulk 23c per lb of alloy, carload pack 24.25c, ton lot 26.15c, less ton 27.15c. I livered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, 1.5-3%). Contract, carload, lump, bulk 2: per lb of alloy, carload packed 25.65c, tl lot 27.95c, less ton 29.45c. Delivered. Spot, a\(\)

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3: lb each and containing 2 lb of Cr). Contrad carload, bulk 19.60c per lb of briquet, in bat 20.70c; 3000 lb to c.l. pallets 20.80c; 20d lb to c.l. in bags 21.90c; less than 20d lb in bags 22.80c, Delivered. Add 0.25c finotching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing appro 3 lb and containing 2 lb of Mn). Contrac carload, bulk 14.8c per lb of briquet; c. packed, bags 16c; 3000 lb to c.l., pallets 167 2000 lb to c.l., bags 17.2c; less ton 18.11 Delivered. Add 0.25c for notching. Spot, acc 0.25c.

Silicomanganese Briquets: (Weighing appro 3½ lb and containing 2 lb of Mn and appro ½ lb of Si). Contract, c.l. bulk 15.1c pe lb of briquet; c.l. packed, bags 16.3c, 3000 l to c.l., pallets 16.3c; 2000 lb to c.l., bag 17.5c; less ton 18.4c. Delivered. Add 0.25c fd notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing ap prox 5 lb and containing 2 lb of Si and smarsizes, weighing approx 2½ lb and containing 1 lb of Si). Contract, carload, bulk 8c per 1 of briquet; packed, bags 9.2c; 3000 lb to c.l pallets 9 6c; 2000 lb to c.l, bags 10.8c; leston 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ I of Mo each). \$1.49 per lb of Mo contained f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, \$1 per lb, f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more \$2.15 per lb (nominal) of contained W. Dek livered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% maxe C 0.4% max). Ton lots 2" x D, \$4 per lb ocontained Cb; less ton lots \$4.05 (nominal) Delivered.

Ferrotantalum Columbium: (Cb 40% approx. Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, \$3.80 per lti of contained Cb plus Ta, delivered; less tors lots \$3.85 (nominal).

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, c.l. packed ¼-in, xe 12 M 20.00c per lb of alloy, ton lot 21.15c.s less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagaraz Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b.. Niagara Falls, N. Y.; freight allowed to St.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l., 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Deliveried.

Ferrophosphorus: (23-25% based on 24% P content with unitage of \$5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., \$120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa. \$1.76 in all sizes except powdered which is \$1.82.

Technical Melybdic-Oxide: Per lb of contained Mo, in cans, \$1.47; in bags, \$1.46, f.o.b. Langeloth and Washington, Pa.



ACCLAIMED BY INDUSTRY FOR

MINIMUM MAINTENANCE

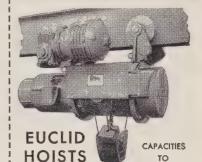
10 TONS

An investment in a Euclid Crane pays off many times in reliable, trouble-free service for an unusually long period of time.

Standard models in a wide range of capacities, styles and spans generally meet average requirements.

A Euclid proposal on a custom crane to your specific needs is available without obligation.

HOIST LITERATURE IS AVAILABLE UPON REQUEST



The EUCLID CRANE AND HOIST Co.

1361 CHARDON RD.

assembling operations.

Write for this CATALOG

26 pages of informative data and com-

plete information on many Euclid Cranes depict how our cranes will benefit your

material handling, manufacturing and

CLEVELAND 17, OHIO

WANTED

Production machining on a job or long-term basis contracts for precision components, assemblies and complete machine building.

1200 modern machine tools and one of the world's largest foundries, now available.

We welcome your inquiry or blueprints for quotation.



New Facilities File . Write today!

CONTRACT DIVISION Textile Machine Works, Dept. 171, Reading, Pa.



Series H

Product Development by William M. Schmidt Associates

ck-up projects design 🕊 perforated metals

Here is an actual H & K perforated metal grille utilized in a mock-up of a record player. This greatly helps the Industrial Designer project his concepts as H & K perforated metal is now in its proper element for consideration of use and selection of pattern.

By referring to the H & K General Catalog, the designer can select one or more perforated patterns for his project.

H & K perforated metals provide the Industrial Designer, and other men of ideas, a medium of unlimited opportunities for designing better and more attractive products.



Thousands of patterns

arrington & PERFORATING CO.

Chicago Office and Warehouse 5627 Fillmore St., Chicago 44

New York Office and Warehouse 118 Liberty St., New York 6

Scrap Index Drops Another 50 Cents

STEEL's composite on the prime grade now stands at \$39.17, and the market is still pointing downward. Lagging consumer interest is intensified by approaching holidays

Scrap Prices, Page 200

Pittsburgh — Prices continue to slip as mills refrain from buying. Brokers report No. 2 bundles are being offered from outside the district at \$26, delivered. They're going begging. Railroad lists are off sharply. The B&O offered No. 1 heavy melting at \$44.15, about \$2.60 less than it got last month. Wheels went for \$47.25, vs. \$51.25 a month ago.

Chicago—Several leading grades of steelmaking scrap are off \$1 a ton on new purchases by a district mill. Grades involved: No. 1 industrial heavy melting, No. 2 heavy melting, No. 1 factory bundles, No. 1 railroad heavy melting, and turnings and borings.

The tonnage moving is small, but it is sufficient to make for a

general agreement on the market price level.

Steelmaking operations in the district are holding at 85.5 per cent of capacity, and indications are this pace will be maintained over the rest of the year.

Philadelphia — Prices continue easy, with domestic demand spotty and export business at a standstill. Short shoveling turnings are lower at \$21-\$22, machine shop turnings at \$18-\$19, and heavy turnings at \$30. Mixed borings and turnings are off nominally to \$19, and rail crops (2 ft and under) are lower at \$55-\$57 on light sales. The cast iron grades are stronger than the steel grades. Malleable is higher at \$59-\$60.

No. 1 heavy melting steel and No. 1 busheling are off \$1 a ton to \$34, delivered, and No. 1 bundle similarly to \$35. No. 2 heavemelting is also down \$1 to \$31, and No. 2 bundles are off 50 cents to \$22.

New York — Brokers' buying prices are easier, with a reduction in No. 2 bundles to \$17-\$18. An other grades are unchanged. Consumption continues light.

Cleveland—Not much activity anticipated in the scrap market this rest of the year. Steelmakers' inventories are substantial, and increased use of blast furnace humetal is holding down scrap need. The market is pointing downward but in the absence of a buying test prices are unchanged and nominals.

Detroit — Purchases by Great Lakes Steel and for the Canadian market last week moved area scrap prices upward. Some 15,000 th 20,000 tons were reportedly involved in the Great Lakes transaction.

Dealers and brokers think the imcrease stems from local speculative conditions. The basic demand for scrap is still light, and prices are





INTRODUCTION TO THE STUDY OF HEAT TREATMENT OF METALLURGICAL PRODUCTS

By Albert Portevin

Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

246 pages 69 illustrations

4 tables Price \$5.00 Postpaid

THE PENTON PUBLISHING CO.

Book Department, 1213 W. 3rd St., Cleveland 13. O.



epected to back off soon. More ctivity in the foundry grades is reported.

Buffalo—The market is off about 2 a ton on mill purchases for Dember delivery. Buyers paid \$28 r No. 2 heavy melting steel and 26 for No. 2 bundles. No. 1 heavy elting is quoted at \$33-\$34. Prices a railroad specialties, scrap rails, ad low phos material declined \$1 ton. Cast scrap is unchanged.

St. Louis—The market is softer, regely because of easiness outside he area. There's not much activy here, and prices are off \$1 a ton in the cast iron grades and some alroad items. Little tonnage is oming into this market, but the hills hold sufficient stocks to suport production.

Cincinnati—Brokers are filling nodest mill orders placed early this nonth. Buyers are being cautious. Consumers are ordering only what hey need to support production chedules. No. I heavy melting is uoted by brokers at \$36-\$37.

Houston—With major consumers ut of the market and all old orers filled, scrap sellers are markng time, awaiting January develpments. Three export cargoes
hay be loaded at Gulf ports for apan, but they will not create any
ew buying because exporters hold eavy accumulations. The Mexian market continues weak.

Supplies of cast iron scrap are utrunning demand, and a decline

in prices is anticipated. On the broker level, steel scrap prices are untested, but with surpluses building up, new consumer buying is thought likely to bring lower prices.

Birmingham—The market continues slow. Open hearth steel consumers are not buying, but one large Birmingham electric furnace interest bought its December needs at \$1 under the last quotation. Most of the pipe mills are out of the market, and those taking in scrap are paying \$1 a ton less for it. The export market is quiet, but two ships are reported loading at Florida ports.

Los Angeles—Prices on No. 1 and No. 2 heavy melting steel have been marked up \$3 a ton. Machine shop turnings at \$13 are up \$2 a ton. The market shows some signs of stabilizing, but the dealers are stil uncertain of the market trend over coming weeks.

San Francisco — Pressure for a price boost is building up here. Some dealers look for early announcement of a \$4 per ton increase on the top grades. Spearheading the pressure is the recent Japanese purchase of 150,000 tons of steel grades.

Seattle—While the recent purchase of a number of full cargoes by Japan gave the market a little strength, sales continue slow. Large consumers have adequate stocks, and they are buying only occasionally. Prices are largely nominal,

but dealers say the better grades are up \$1 a ton.

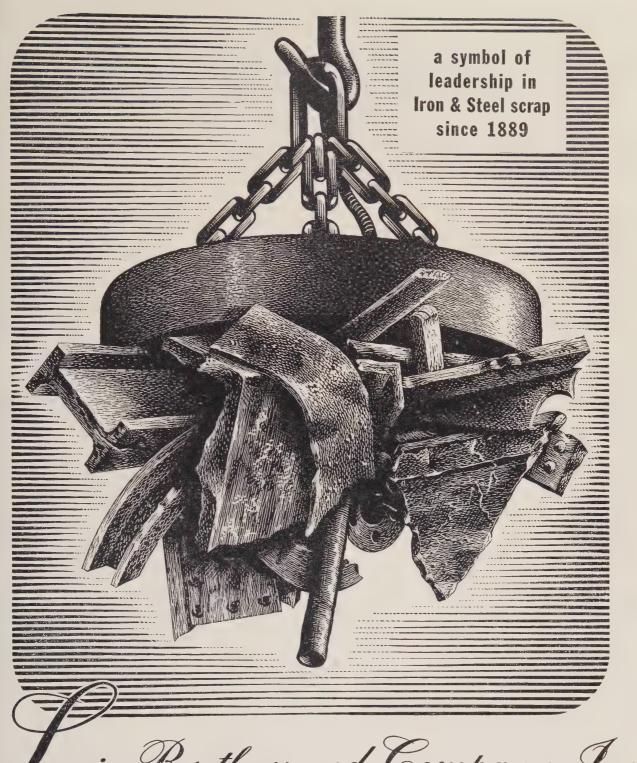
Toronto—Settlement of the recent strike at the Hamilton Works of Steel Co. of Canada has been followed by an advance in Canadian scrap prices. Consumer buying continues sluggish; the mills are buying on a selective basis. Borings and turnings are not moving, but some small lots of heavy melting, bundles and busheling are being taken.



No matter for what reason you come to Baltimore, the chances are we're nearest to where you want to go.



Iron and Steel Scrap	Consumer prices per gross ton, STEEL, Dec. 10, 1958. Changes	except as otherwise noted, including shown in italics.	brokers' commission, as reported
STEELMAKING SCRAP	CLEVELAND	PHILADELPHIA	BOSTON
COMPOSITE	No. 1 heavy melting 38.50-39.50	No. 1 heavy melting 34.00 No. 2 heavy melting 31.00	(Brokers' buying prices; f.o., shipping point)
Dec. 10	No. 2 heavy melting 25.00-26.00 No. 1 factory bundles . 43.00-44.00	No. 1 bundles 35.00 No. 2 bundles 22.00	No. 1 heavy melting 25.00-2 No. 2 heavy melting 20.00-2
Nov. Avg 41.42 Dec. 1957 32.77	No. 1 bundles 38.50-39.50 No. 2 bundles 28.50-29.50 No. 1 busheling 38.50-39.50	No. 1 busheling34.00 Electric furnace bundles 37.00 Mixed borings, turnings 18.00†	No. 1 bundles 25.00-2 No. 1 busheling 25.00-2
Dec. 1953 36.69	Machine shop turnings. 14.00-15.00 Short shovel turnings. 20.00-21.00	Mixed borings, turnings 18.00† Short showel turnings 21.00 Machine shop turnings 18.00	Machine shop turnings 7.001 Short shovel turnings 10.00-1-1
Based on No. 1 heavy melting	Mixed borings, turnings 20.00-21.00 Cast iron borings 20.00-21.00	Heavy turnings 33.00 Structurals & plate 39.00-40.00	No. 1 cast 2 Mixed cupola cast 3
grade at Pittsburgh, Chicago, and eastern Pennsylvania.	Cut foundry steel 39.00-40.00 Cut structurals, plates	Couplers, springs, wheels 42.00-43.00 Rails, crops, 2 ft & under 56.00-57.00	No. 1 machinery cast . 3
	2 ft and under 47.00-48.00 Low phos, punching &	Cast Iron Grades	DETROIT (Brokers' buying prices; f.o.bt)
PITTSBURGH	Alloy free, short shovel	No. 1 cupola	shipping point)
No. 1 heavy melting 41.00-42.00 No. 2 heavy melting 33.00-34.00 No. 1 dealer bundles 41.00-42.00	turnings	Malleable	No. 1 heavy melting 34.00-3. No. 2 heavy melting 21.00-2.
No. 1 dealer buildles 27.00-28.00 No. 1 busheling 41.00-42.00	Cast Iron Grades	NEW YORK	No. 1 bundles 35.00-3 No. 2 bundles 22.00-4 No. 1 busheling 34.00-3
No. 1 factory bundles 46.00-47.00 Machine shop turnings, 20.00-21.00	No. 1 cupola 44.00-45.00 Charging box cast 37.00-38.00	(Brokers' buying prices) No. 1 heavy melting 27.00-28.00	Machine shop turnings. 13.00-1. Mixed borings, turnings. 14.00-1.
Mixed borings, turnings 20.00-21.00 Short shovel turnings 25.00-26.00	Heavy breakable cast 36.00-37.00 Stove plate 43.00-44.00 Unstripped motor blocks 32.00-33.00	No. 2 heavy melting 24.00-25.00 No. 1 bundles 27.00-28.00	Short shovel turnings 15.00-1. Punching & plate 37.00-3.
Cast iron borings, 25.00-26.00 Cut structurals:	Brake shoes 36.00-37.00 Clean auto cast 49.00-50.00	No. 2 bundles	Cast Iron Grades
2 ft and under 47.00-48.00 3 ft lengths 46.00-47.00 Heavy turnings 34.00-35.00	Burnt cast	Short shovel turnings. 13.00-14.00 Low phos. (structurals	No. 1 cupola
Punchings & plate scrap. 47.00-48.00 Electric furnace bundles. 47.00-48.00	Railroad Scrap	& plates) 33.00-34.00 Cast Iron Grades	Charging box cast 34.00-33 Heavy breakable 35.00-33 Unstripped motor blocks. 19.00-23
Cast Iron Grades	R.R. malleable 63.00-64.00 Rails, 2 ft and under 57.00-58.00	No. 1 cupola 35.00-36.00 Unstripped motor blocks 23.00-24.00	Clan auto cast 49.00-5.
No. 1 cupola 44.00-45.00 Stove plate 41.00-42.00	Rails, 18 in. and under 58.00-59.00 Rails, random lengths. 52.00-53.00	Heavy breakable 32.00-33.00	SEATTLE
Unstripped motor blocks 31.00-32.00 Clean auto cast 39.00-40.00	Cast steel	Stainless Steel 18-8 sheets, clips	No. 1 heavy melting 3. No. 2 heavy melting 2
Drop broken machinery 51.00-52.00	Uncut tires	solids	No. 2 bundles 23 No. 2 bundles 23
Railroad Scrap No. 1 R.R. heavy melt. 44.00-45.00	Stainless Steel	430 sheets, clips, solids 75.00-80.00	Machine shop turnings. 9.00-10 Mixed borings, turnings 9.00-10 Electric furnace No. 1.
Rails, 2 ft and under 56.00-57.00 Rails, 18 in. and under. 57.00-58.00	(Brokers' buying prices; f.o.b.	BUFFALO	Cast Iron Grades
Random rails 53.00-54.00 Railroad specialties 48.00-49.00	shipping point)	No. 1 heavy melting 33.00-34.00 No. 2 heavy melting 27.00-28.00 No. 1 bundles 33.00-34.00	No. 1 cupola 3111 Heavy breakable cast 296
Angles, splice bars 48.00-49.00 Rails, rerolling 58.00-59.00	18-8 bundles, solids205.00-215.00 18-8 turnings115.00-120.00 430 clips, bundles,	No. 2 bundles 25.00-26.00 No. 1 busheling 33.00-34.00	Unstripped motor blocks Stove plate (f.o.b.
Stainless Steel Scrap	solids	Mixed borings, turnings 17.00-18.00 Machine shop turnings, 15.00-16.00	plant) 2111 LOS ANGELES
18-8 bundles & solids225.00-230.00 18-8 turnings125.00-130.00	ST. LOUIS	Short shovel turnings 19.00-20.00 Cast iron borings 17.00-18.00	No. 1 heavy melting
430 bundles & solids. 125.00-130.00 430 turnings 55.00-65.00	(Brokers' buying prices)	Low phos. structurals and plate, 2 ft and under 42.00-43.00	No. 2 heavy melting
CHICAGO	No. 1 heavy melting 38.00 No. 2 heavy melting 36.00	Cast Iron Grades (F.o.b. shipping point)	No. 2 bundles 11 Machine shop turnings 11 Shoveling turnings 11
No. 1 hvy melt, indus. 43.00-44.00 No. 1 heavy melt. dealer 40.00-41.00	No. 1 bundles 40.00 No. 2 bundles 29.00 No. 1 bundles 29.00	No. 1 cupola 44.00-45.00 No. 1 machinery 48.00-49.00	Cast iron borings 11. Cut structurals and plate
No. 2 heavy melting 35.00-36.00 No. 1 factory bundles 46.00-47.00 No. 1 dealer bundles 42.00-43.00	No. 1 busheling 40.00 Machine shop turnings 19.50† Short shovel turnings 21.50†	Railroad Scrap Rails, random lengths. 47.00-48.00	1 ft and under 4x
No. 2 bundles 29.00-30.00 No. 1 busheling, indus. 43.00-44.00	Cast Iron Grades	Rails, 3 ft and under. 53.00-54.00 Railroad specialties 42.00-43.00	(F.o.b. shipping point)
No. 1 busheling, dealer 40.00-41.00 Machine shop turnings. 21.00-22.00	No. 1 cupola 48.00	CINCINNATI	No. 1 cupola 4
Mixed borings, turnings, 23.00-24.00 Short showed turnings, 23.00-24.00	Charging box cast 40.00 Heavy breakable cast 38.00 Unstripped motor blocks 39.00	(Brokers' buying prices; f.o.b. shipping point)	No. 1 R.R. heavy melt.
Cast iron borings 23.00-24.00 Cut structurals, 3 ft 47.00-48.00 Punchings & plate scrap. 48.00-49.00	Clean auto cast	No. 1 heavy melting 36.00-37.00 No. 2 heavy melting 31.00-32.00	SAN FRANCISCO
Cast Iron Grades	Railroad Scrap	No. 1 bundles 36.00-37.00 No. 2 bundles 24.00-25.00	No. 1 heavy melting 32.00-31 No. 2 heavy melting 30.00-31 No. 1 bundles
No. 1 cupola 45.00-46.00 Stove plate 43.00-44.00	No. 1 R.R. heavy melt. 44.00 Rails, 18 in. and under 52.00†	No. 1 busheling 36.00-37.00 Machine shop turnings. 17.00-18.00	No. 2 bundles 23 Machine shop turnings 1 Mixed borings, turnings 1
Unstripped motor blocks 37.00-38.00 Clean auto cast 52.00-53.00	Rails, random lengths. 47.50 Rails, rerolling 59.50	Mixed borings, turnings 18.00-19.00 Short shovel turnings. 20.00-21.00	Mixed borings, turnings Cast iron borings 1
Drop broken machinery 52,00-53.00 Railroad Scrap	Angles, splice bars 47.00 BIRMINGHAM	Cast iron borings 18.00-19.00 Low phos., 18 in 45.00-46.00	Heavy turnings 1 Short shovel turnings. 1
No. 1 R.R. heavy melt. 45.00-46.00	No. 1 heavy melting 35.00-36.00	Cast Iron Grades No. 1 cupola 45.00-46.00	Cut structurals, 3 ft 4.
R.R. malleable 57.00-58.00 Rails, 2 ft and under. 58.00-59.00 Rails, 18 in, and under 59.00-60.00	No. 2 heavy melting 28.00-29.00 No. 1 bundles 35.00-36.00	Heavy breakable cast 38.00-39.00 Charging box cast 38.00-39.00 Drop broken machinery 47.00-48.00	No. 1 cupola 44 Charging box cast 3
Angles, splice bars 54.00-55.00 Axles 69.00-70.00	No. 2 bundles 21.00-22.00 No. 1 busheling 35.00-36.00	Drop broken machinery 47.00-48.00 Railroad Scrap	Stove plate
Rails, rerolling 63.00-64.00	Machine shop turnings. 22.00-23.00	No. 1 R.R. heavy melt. 42.00-43.00 Rails, 18 in. and under 55.00-56.00	Unstripped motor blocks Clean auto cast 4
Stainless Steel Scrap 18-8 bundles & solids215.00-220.00	Short shovel turnings 23.00-24.00 Bars, crops and plates 43.00-44.00 Structurals & plates 42.00-43.00	Rails, random lengths 49.00-50.00	No. 1 wheels 3
18-8 turnings115.00-120.00 430 bundles & solids115.00-120.00	Electric furnace bundles, 38.00-39.00 Electric furnace:	HOUSTON (Brokers' buying prices; f.o.b. cars)	HAMILTON, ONT.
430 turnings 45.00-50.00	2 ft and under 36.00-37.00 3 ft and under 35.00-36.00	No. 1 heavy melting 40.00†	No. 2 heavy melting 3 No. 2 heavy melting 3
YOUNGSTOWN No. 1 heavy melting ., 42.00-43.00	Cast Iron Grades	No. 2 heavy melting 34.00† No. 1 bundles 40.00† No. 2 bundles 25.00†	No. 1 heavy melting 3 No. 2 heavy melting 3 No. 1 bundles 3 No. 2 bundles 2 Mixed steel scrap 2
No. 1 heavy melting	No. 1 cupola	Machine shop turnings. 17.00 Short shovel turnings. 20.00	Mixed steel scrap 2 Mixed borings, turnings 1 Busheling, new factory:
No. 1 bundles 42.00-43.00 No. 2 bundles 29.00-30.00	Unstripped motor blocks. 40.00-41.00 Charging box cast 29.00-30.00 No. 1 wheels 42.00-43.00	Low phos. plates & structurals 45.50†	Prepared 3' Unprepared 2'
Machine shop turnings. 15.00-16.00 Short shovel turnings. 20.00-21.00 Cast iron borings 20.00-21.00	Railroad Scrap	Cast Iron Grades	Short steel turnings 1
Low phos	No. 1 R.R. heavy melt. 37.00-39.00 Rails, 18 in. and under 49.00-50.00	No. 1 cupola	Cast Iron Grades; No. 1 machinery cast 39.00-4
Railroad Scrap	Rails, rerolling 54.00-55.00 Rails, random lengths. 44.00-45.00	Unstripped motor blocks 35.00 Railroad Scrap	*Brokers' buying prices.
No. R.R. heavy melt. 44.00-45.00	Angles, splice bars 45.00-46.00		‡F.o.b. Hamilton, Ont.



uria Brothers and Company, Inc.

MAIN OFFICE PHILADELPHIA NATIONAL BANK BLDG. Philadelphia 7, Penna.

PLANTS

LEBANON, PENNA. DETROIT (ECORSE), READING, PENNA. MICHIGAN MODENA, PENNA. PITTSBURGH, PENNA. ERIE, PENNA.

OFFICES

HOUSTON, TEXAS PITTSBURGH, PA. BIRMINGHAM, ALA. KOKOMO, IND. PUEBLO, COLORADO BOSTON, MASS. BUFFALO, N.Y. LEBANON, PENNA. READING, PENNA. LOS ANGELES, CAL. ST. LOUIS, MO. CHICAGO, ILLINOIS CLEVELAND, OHIO MEMPHIS, TENN. SAN FRANCISCO, CAL. NEW YORK, N. Y. SEATTLE, WASH. DETROIT, MICH. in Canada MONTREAL, QUEBEC - HAMILTON, ONTARIO

EXPORTS-IMPORTS LIVINGSTON & SOUTHARD, INC. 99 Park Ave., New York, N. Y. Cable Address: FORENTRACO

December 15, 1958

Lid Put on Aluminum Prices

Industry freezes present pig and mill product quotations until after June 30. Expect higher charges soon after that. Shipments and production on the upswing

Nonferrous Metal Prices, Pages 204 & 205

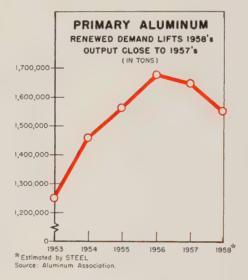
ANY PLANS to bump aluminum quotations were scotched on Dec. 5 when Aluminum Co. of America and Kaiser Aluminum & Chemical Corp. announced present price lists would apply to all products ordered and shipped before July 1.

The action squelches rumors that the industry would boost charges early in 1959 and brings up this question: Why would the industry take such a step when it's known that aluminum management would like to recover more of the 2-centa-pound price drop that went into effect last April? (Quotations were jumped 0.7 cent a pound on Aug. 1, but the industry was also hit with labor increases of 19 cents a pound at that time.)

- Chronology—Here's the step-by--step playback. It all started earlier in the month when Aluminium Ltd. Sales Inc. sent a letter to its customers announcing that the 60-day price protection clause on new orders would not be in effect after Dec. 31. Aluminium added that it would ship ingots at the current quotation through June 30 if orders were placed before the Dec. 31 deadline. The company said it made this move at the request of independent fabricators because "competitive practices have led price protection to defeat its intended pur-
- Unpopular—Aluminium initiated the 60-day price protection clause in November, 1957. U. S. producers, who say they never wanted it, went along and on occasion have extended the protective period to 90 and 120 days. Some independent fabricators, particularly extruders, never did like the protection clause. Reason: They sometimes had to continue charging on the old basis for a time after

their own price protection had run out.

Aluminium's move initially looked like it would still complaints of the independents and lay the groundwork for an early price rise. But the stipulation that shipments



of ingots would be made through midyear at current prices held strong promise of touching off a buying avalanche.

• Countermove — Competition immediately responded. Reynolds Metals Co. was first with an announcement that it would offer price protection on ingots and mill

products through June 30 if order were placed in December. The next logical step was the announcements by Alcoa and Kaiser. Becaute of the control of the co

- Pay More Later—While prid can't move up now until midyes it's a safe bet you'll be paying more for aluminum shortly after that The reason's simple: Producers as getting 1.3 cents a pound less flipig now than they were in earl 1957 even though total laber charges have risen 24 cents an horin the interim. The current three year labor contract ends during the summer.
- Business Better—On the brights side, aluminum business is steadil picking up. October shipments sheets and plates hit 54,915 ton compared with 50,221 tons in September, reports the Aluminum Association. Total for the first tomonths is 491,800 tons, vs. 544,14 tons in the same period last year October foil shipments bettered the September figure 9340 tons to 8700 Totals for the first ten months as running ahead of 1957's: 79,41 tons, vs. 74,425 tons.
- Production Rising—U. S. priman output is on the upswing but winstill fall short of last year's total by about 97,000 tons. Steel products smelter production this year will be in the neighborhood of 11 550,000 tons, compared with 1,647 710 last year. Estimates peg 195; output as falling between 1,8000 000 tons and 1,875,000 tons.

NONFERROUS PRICE RECORD

	Price Dec. 10		Last lang		Previous Price	Nov. Avg	Oct. Avg	Dec., 1957 Avg
Aluminum .	24.70	Aug.	1,	1958	24.00	24.700	24.700	26,000
Copper	28.50-29.00	Dec.	3,	1958	29.00	29.415	28.058	26.130
Lead	12.80	Oet.	14,	1958	12.30	12.800	12.473	13.300
Magnesium .	35.25	Aug.	13,	1956	38.75	35.250	35.250	35.250
Nickei	74.00	Dec.	6,	1956	64.50	74.000	74.000	74.900
Tin	99.25	Dec.	10,	1958	99.125	99.034	96.500	92.395
Zinc	11.50	Nov.	7,	1958	11.00	11.386	10.865	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIM, Straits, deld. New York; NISKEE, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.

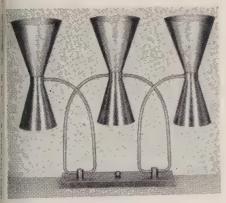
COPPER ALLOY BULLETIN



Reporting New Developments in Copper-Brass Alloys and Metalworking Methods



Conductivity and fast, low-cost fabrication are important qualities Bridgeport tube supplies for parts like this finned copper tube defroster coil.



High quality surface finish and easy workability are specified—and supplied by Bridgeport—in tube used in modern lamps like these.



Ease of fabrication, heat conductivity and corrosion resistance make copper tube the ideal choice for parts like this automatic transmission cooling unit.

WHY IT PAYS TO FABRICATE WITH BRIDGEPORT SEAMLESS TUBE

Bridgeport brass and copper seamless tube is an unusually versatile metal form which has a host of qualities, characteristics and uses few other metals can provide. Used in lamps, andirons, automotive parts, cooling units, furniture and other items, it fills a wide range of product and production requirements.

Why Seamless Tube?

Fabricators select Bridgeport Seamless Tube for many reasons. Its beauty and warmth lend much to the appeal of consumer products, for example. And its corrosion resistance and rustproofness make it desirable where other metals fail. Another important plus factor of seamless tube is its easy workability. Machining, bending, forming, cutting and cupping all are easier. Its wonderfully smooth surface finish simplifies polishing and plating. Close OD, ID and wallthickness tolerances are maintained. This simplifies fabricating, keeps costs down and insures more uniform end products.

Economy...

In addition to the fabrication savings mentioned, additional economies are realized with Bridgeport Seamless Tube because it is produced in long lengths to insure uninterrupted production runs.

Characteristics...

Still another advantage is the wide range of characteristics available. You can specify combinations of mechanical, physical and fabrication properties as well as tempers to suit every need.

And Quality...

Made in one of the country's most modern tube mills, Bridgeport tubes are checked and inspected at every stage of manufacture to assure adherence to specifications. Bridgeport's other tests cover surface finish, interior strength, accuracy of gage and diameter, chemical analysis, strain, expansion and microstructure.

Find Out More

...about Bridgeport Seamless Tube in a wide range of brass or copper alloys for use in fabricating. Our Technical Service Men can help you solve application problems. Just call your nearest Bridgeport Sales Office, or, if you prefer, write direct to Bridgeport Brass Company, Bridgeport 2, Connecticut, Dept. 3413.

Nonferrous Metals

Cents per pound, carlots except as otherwise

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30.000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, \$71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, \$74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, 1 lb of contaned Be, with balance as \$43 per market price on shipment date, f.o.b. shipping

Bismuth: \$2.25 per lb, ton lots.

Cadmium: Sticks and bars, \$1.45 per lb deld. Cohalt: 97.99%, \$2.00 per lb for 550-lb keg; \$2.02 per lb for 100 lb case; \$2.07 per lb under 100 lb.

Columbium: Powder, \$55-85 per lb, nom.

Copper: Electrolytic, 29.00 deld.; custom smelters, 28.50-29.00; lake, 29.00 deld.; fire refined, 28.75 deld.

Germanium: First reduction, \$179.17-197.31 per lb; intrinsic grade, \$197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, \$35 per oz.

Indium: 99.9%, \$2.25 per troy oz. Iridium: \$70-80 nom. per troy oz.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis. New York basis, add 0.20

Lithlum: 98 + %, 50-100 lb, cups or ingots, \$12; rod, \$15; shot or wire, \$16. 100-500 lb, cups or ingots, \$10.50; rod, \$14; shot or wire, \$15, f.o.b. Minneapolis.

Magnesium: Pig. 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Allloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, 9Z91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, \$224-227 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, \$9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

2500 lb or more, f.o.b. Detroft.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for adition to east iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to east iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Smilum: \$70-100 per troy, oz nom.

Osmium: \$70-100 per troy oz nom

Palladium: \$15-17 per troy oz.

Platinum: \$52-55 per troy oz from refineries.

Radium: \$16-21.50 per mg radium content. depending on quantity.

Rhodium: \$118-125 per troy oz.

Ruthenium: \$45-55 per troy oz.

Selenium: \$7.00 per lb, commercial grade.

Silver: Open market, 90.125 per troy oz.

Sodium: 17.00 c.l.; 19.00-19.50 l.c.l.

Tantalum: Rod, \$60 per lb; sheet, \$55 per lb. Tellurium: \$1.65-1.85 per lb.

Thallium: \$7.50 per 1b.

Tin: Straits, N. Y., spot and prompt, 99.25.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), \$1.62-1.82; grade A-2 (0.5% Fe max.), \$1.70 per lb.

Tungsten: Powder, 89.8%, carbon reduced, 1000-lb lots, \$3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, \$3.30-3.80.

Zinc: Prime Western, 11.50; brass special, 11.75; intermediate, 12.00, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 12.50; special high grade, 12.75 deld. Diecasting alloy ingot No. 3, 14.00; No. 2, 14.25; No. 5, 14.50 deld. brass special, Zirconium: Reactor grade sponge, 100 lb or less. \$7 per lb; 100-500 lb, \$6.50 per lb; over 500 lb, \$6 per lb.

(Note: Chromium, manganese, and silicon met-als are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.875-25.25; No. 12 foundry alloy (No. 2 grade), 21.75-22.00; 5% silicon alloy, 0.60 Cu max, 24.75-25.00; 13 alloy, 0.60 Cu max, 24.75-25.00; 13 alloy, 0.60 Cu max, 24.75-25.00; 198 alloy, 25.25-22.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.25; grade 2, 22.00; grade 3, 21.00; grade 4, 19.00.

Brass Ingot: Red brass, No. 115, 28.00; tin bronze, No. 225, 37.50; No. 245, 32.25; high-leaded tin bronze, No. 306, 32.25; No. 1 yellow, No. 405, 23.00; manganess bronze, No. 421, No. 4 24.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, \$1.885, f.o.b. Temple, Pa., or Reading, Pa.; rod. bar, wire, \$1.865, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 34.35; l.c.l., 34.98. Weatherproof, 20,000-lb lots, 35.54; l.c.l., 36.29.

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, \$18.50 per cwt; pipe, full coils, \$18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip \$8.50-15.95; sheared mill plate, \$6.00-9.50; wire, \$6.50-10.50; forging billets, \$3.80-4.35; hot-rolled and forged bars. \$5, 10-6, 25,

(Prices per lb, c.l., f.o.b. mill.) Sheets, 2 ribbon zinc in coils, 21.50; plates, 20.00. 26.00:

ZIRCONTUM

Plate, \$12.50-19.20; H.R. strip, \$12.50-22.90; C.R. strip, \$15.90-31.25; forged or H.R. bars. \$11.00-17.40.

NICKEL, MONEL, INCONEL

"A"	Nickel	Monel	Inconel
Sheets, C.R	126	106	128
Strip, C.R	124	108	138
Plate, H.R	120	105	121
Rod, Shapes, H.R	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003, and 5005 mill finish (30,000 lb base; freight allowed). Thickness

Range,	Flat	Coiled
Inches	Sheet	Sheet
0.250-0.136	42.80-47.30	4444444
0.136-0.096	43.20-48.30	
0.126-0.103	1 1111111	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	********
0.077-0.061	1110 02.20	39.50-40.70
0.068-0.061	44.30-52.20	
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	
0.030-0.024		41.00-45.70
0.024-0.019	46.20-53.70	41.30-45.70
	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.80	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70
	00.00	00.10

ALTIMINUM (continued)

Thickness and Circles: Plates 24-60 in. width or diam., 72-240 in. lengt;

		11
Alloy	Plate Base	Circle BE
1100-F,	3003-F 42.40	47.20
5050-F	43.50	48.30K
3004-F	44.50	50.20k
5052-F	45.10	50.90K
6061-T6		51.70K
2024-T4		56.10
7075-T6'	• 57.60	64.70 N

*24-48 in. width or diam., 72-180 in. lengtri

Screw	Machine	Stock:	30,000	1b	base.	
Diam.	(in.) or	Ro	und	-	-Hexa	gona
cross	flats* 2			201	1-T3	2017-
0.12	5	76 90	73.90			76
0.25)	62.00	60.20		89.10	
0.37	5	61.20	60.00		73.50	68
0.500)	61.20	60.00		73.50	68
0.625	5	61.20	60.00		69.80	64
0.750)	59.70	58.40		63.60	60.
0.87		59.70	58.40		63.60	60.
1.000)	59.70	58.40		63.60	60
1.12	5	57.30	56.10		61.50	58.
1.250)	57.30	56.10		61.50	58.
1.350)	57.30	56.10		61.50	58.
1.500)	57.30	56.10		61.50	58.
1.625	5	55.00	53.60			56.
1.750)	55.00	53.60		60.30	56.
1.875	5	55.00	53.60			56.
2.000		55.00	53.60		60.30	56.
2.125	5	53.50	52.10			
2.250)	53.50	52.10			56.
2.375	i	53.50	52.10			
2.500)	53.50	52.10			56.
2.625	i		50.40			
2.750	}	51.90	50.40			56.
2.875	i		50.40			
3.000)	51.90	50.40			56.
3.125	5		50 40			
3.250)		50.40			
3.375	5		50.40			

*Selected sizes.
Forging Stock: Round, Class 1, rando: lengths, diam. 0.375-8 in., "F" temper; 201 42.20-55.00; 6061, 41.60-55.00; 7075, 61.675.00; 7070, 66.60-80.00.
Pipe: ASA schedule 40, alloy 6063-T6 stam ard lengths, plain ends, 90.000 lb base, dollar per 100 ft. Nominal pipe sizes: ¾ in., 18.81 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in 432.70.

Extruded Solid Shapes:

	Alloy	Alloy
Factor	6063-T5	6062-TH
9-11	42.70-44.20	51.30-55
12-14	42.70-44.20	52.00-56
15-17	42.70-44.20	53.20-58
18-20	43.20-44.70	55.20-60.

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0 in., 103.10; .081 in., 77.90; .125 in., 70.40; .11 in., 69.00; .250-2.0 in., 67.90. AZ31B spegrades, .032 in., 171.30; .081 in., 108.74 .125 in., 98.10; .188 in., 95.70; .250-2.00 in 93.30. Tread plate, 60-192 in. lengths, 24.72 iii widths; .125 in., 74.90; .188 in., 71.70-72.13 .25-75 in., 70.60-71.60. Tooling plate, .25-11.

Extruded	Solid Shapes:	
	Com. Grade	Spec. Gran
Factor	(AZ31C)	(AZ31B))
6-8	69.60-72.40	84.60-87.4
12-14	70.70-73.00	85.70-88.
24-26	75.60-76.30	90.60-91.
36-38	89.20-90.30	104.20-105.2

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.) Copper and Brass: No. 1 heavy copper and wire 21.00-21.50; No. 2 heavy copper and wire 19.00-19.50; light copper, 17.25-17.75; No. composition red brass, 16.00-16.50; No. 1 cons

BRASS MILL PRICES

		MILL PR	ODUCTS a		SCRAP A	LLOW	ANCESE
	Sheet,				(Based on c	copper a	at 29.000
	Strip,			Seamless	Clean	Rod	Clean
	Plate	Rod	Wire	Tubes	Heavy		Turning
Copper	53.13b	50.36c		53.39	25.000	25.000	24.250
Yellow Brass	46.57	31.22d	47.11	49.98	17.000	16.750	
Low Brass, 80%	49.23	49.17					
Red Brass. 85%	50.17		48.87	52.54	21.250	21.000	
Com Proper 000		50.11	50.71	53.48	22.125	21.875	21.375
Com. Bronze, 90%	51.65	5 1.59	52.19	54.71	22.875	22,625	22.125
Manganese Bronze	54.98	48.58	59.08		17,750	17.500	16.875
Muntz Metal	49.35	44.66			17.875	17.625	
Naval Brass	51.24	45.05	57.80	54.65	17.625	17.375	
	58.27	57.46	57.81				
	62.20			75.95	24.625	24.625	
Phoe Bronze	02.20	66.60	64.03		23.875	23.625	11.937
Phos. Bronze	72.59	73.09	72.59	74.27	25.875	25.625	24.625
a. Cents per lb, f.o.b.	mill; freight	allowed	on 500 lb or	more, b.	Hot-rolled.	- Cl-1	3 3
u. Free cutting, e. Prices	in cents be	er lb for	less than 20	000 lb # 6	h ghinning	noint	On lot
over 20,000 lb at one tim	e, of any o	r ali kin	ds of screp	2dd 1 cent	a peripping	Pomi	011 100
	-, 00003		w or burn,	war T cent	per ID.		- 1

sition turnings, 15.00-15.50; new brass clip-igs, 14.25-14.75; light brass, 10.50-11.00; ivy yellow brass, 11.50-12.00; new brass rod is, 12.00-12.50; auto radiators, unsweated, 50-13.00; cocks and faucets, 13.00-13.50; iss pipe, 13.00-13.50.

ad: Heavy, 8.25-8.75; battery plates, 3.00-55; linotype and stereotype, 10.50-11.00; electype, 9.00-9.50; mixed babbitt, 9.50-10.00. mel: Clippings, 31.00-33.00; old sheets, 00-30.00; turnings, 22.00-24.00; rods, 31.00-

ckel: Sheets and clips, 52.00-55.00; rolled odes, 52.00-55.00; turnings, 37.00-40.00; rod is, 52.00-55.00.

ie: Old zinc, 4.00-4.25; new diecast scrap, 15-4.00; old diecast scrap, 2.50-2.75.

aminum: Old castings and sheets, 9.75-.25; clean borings and turnings, 6.50-7.00; gregated low copper clips, 13.00-13.50; segreted high copper clips, 12.50-13.00; mixed low pper clips, 12.50-13.00; mixed high copper s. 11.00-11.50 pper clips, 12. ps, 11.00-11.50.

(Cents per pound, Chicago)

uminum: Old castings and sheets, 11.00-50; clean borings and turnings, 9.00-9.50; gregated low copper clips, 16.00-16.50; segreted high copper clips, 15.00-15.50; mixed low pper clips, 15.00-15.50; mixed high copper pper clips, 15. ps, 14.50-15.00.

(Cents per pound, Cleveland)

uminum: old castings and sheets, 10.00-10.50; an borings and turnings, 9.00-9.50; segreted low copper clips, 14.00-14.50; segregated sh copper clips, 12.50-13.00; mixed low coper clips, 13.00-13.50; mixed high copper clips, 00.19.50

REFINERS' BUYING PRICES ents per pound, carlots, delivered refinery)

ryllium Copper: Heavy scrap, 0.020-in, and avier, not less than 1.5% Be, 55.00; light rap, 50.00; turnings and borings, 35.00.

pper and Brass: No. 1 heavy copper and re, 24.00; No. 2 heavy copper and wire, .50; light copper, 20.25; refinery brass (60% pper) per dry copper content, 22.00.

INGOTMAKERS' BUYING PRICES

rpper and Brass: No. 1 heavy copper and re, 24.00; No. 2 heavy copper and wire, .50; light copper, 20.25; No. 1 composition rings, 18.50; No. 1 composition solids, 19.00; avy yellow brass solids, 13.00; yellow brass rnings, 12.00; radiators, 15.25.

PLATING MATERIALS

shipping point, freight allowed on

ANODES

admium: Special or patented shapes, \$1.45.
ppper: Fiat-rolled, 46.79; oval, 45.00; 50001,000 lp; electrodeposited, 38.50, 2000-5000
lots; cast, 41.00, 5000-10.000 lb quantities. lckel: Depolarized, less than 100 lb, 114.25; 10-499 lb, 112.00; 500-4999 lb, 107.50; 5000-1,999 lb, 105.25, 30,000 lb, 103.00. Carbonized, educt 3 cents a lb.

in: Bar or slab, less than 200 lb, 117.50; 200-19 lb, 116.00; 500-999 lb, 115.50; 1000 lb or ore, 115.00.

ine: Balls, 18.00; flat tops, 18.00; flats, 0.75; ovals, 20.00, ton lots.

CHEMICALS

admium Oxide: \$1.45 per lb in 100-lb drums. hromic Acid (flake): 100-2000 lb, 31.00; 2000-),000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000) or more 29.50.

opper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19.900 lb, 61.90.

Opper Sulphate: 100-1900 lb, 14.65; 2000-5900 b, 12.65; 6000-11,900 lb, 12.40; 12,000-22,900 b, 12.15; 23.000 lb or more, 11.65.

tekel Chiertele: 100 lb, 45.00; 200 lb, 43.00; 00 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 8.00; 10.000 lb or more. 37.00.

ickel Sulphate: 5000-22,999 lb, 29.00; 23,000-9.990 lb, 28.50; 40.000 lb or more, 28.00.
odlum Cyanide (Cyanobrik): 200 lb, 20.80; 00-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000
or more, 17.80.

odlum Stannate: Less than 100 lb, 78.00; 100-00 lb, 68.80; 700-1900 lb, 66.00; 2000-9900 lb, 4.10; 10.000 lb or more, 62.80.

tannous Chloride (anhydrous): 25 lb, 153.20; 00 lb, 148.30; 400 lb, 145.90; 800-19,900 lb, 05.00; 20.000 lb or more, 98.90.

tannous Sulphate: Less than 50 lb, 138.40; 0 lb, 108.40; 100-1900 lb, 106.40; 2000 lb or aore, 104.40.

ine Cyanide: 100-200 lb, 59.00; 300-900 lb,

Britain's Restrictions On Scrap Exports Eased

The British government lifted restrictions on most scrap metal exports for two months beginning Dec. 5. Exceptions are armament scrap and stainless steel and other alloys worth more than \$70 a ton. An open general license for exports of scrap has been issued and will be valid until Feb. 4. The future of scrap exports will be considered next year. A member of Parliament, Sir Peter Roberts, criticized the scrap licensing system, stating there had been a loss of about \$40,-400,000 in exports in the last four months.

Moves Grinding Wheels Div.

United States Rubber Co., New York, is moving its Grinding Wheels Div. from Ft. Wayne, Ind., to 10 Eagle St., Providence, R. I., and will discontinue its Ft. Wayne operation around the end of the year. New facilities in Providence will handle the manufacture of resin and rubber bonded grinding wheels.

AEC Alters U308 Buying

The Atomic Energy Commission has modified its 1962-66 uranium concentrate purchase program. It will continue to buy acceptable U308 concentrates at \$8 per pound through the period if the ore reserves were developed before Nov. 24, 1958.

CLASSIFIED ADVERTISING

Help Wanted

STRUCTURAL ENGINEER

Structural steel designer and estimator for industrial buildings and miscellaneous steel structures, as well as steel plate fabrication. Applicant should be graduate engineer, preferably 30-40 years old, with minimum of 5 years actual structural steel design experience. Permanent employment, paid vacations, group insurance plan. Excellent opportunity. Location Mid-Continent. Good Schools. Employer is nationally known, well established steel fabricator. Reply fully, giving resume of experience, education, age and salary requirements to Box 709, STEEL, Penton Building, Cleveland 13, Ohio.

FIRST CLASS COMMISSION SALESMEN
For Seamless & Welded Steel Tubular Products.
Steel Mill Products. Bars—Structural Steel—
Plates—Sheets—Wire Products—Specialties. To
call on Jobbers—Warehouses—Fabricators. Following States Available: Georgia—Carolinas—
Kentucky — Virginia — Ohio — Indiana —
Pennsylvania—New York—New England—Kansas—Missouri—Illinois Area. Must be experienced
—have car— and reside in territory covered.
Write Box 708, STEEL, Penton Bldg., Cleveland
13, Ohio, with references.

SUPERINTENDENT SUPERINTENDENT
To manage snop for structural steel fabricator
and vesse, builder in East. Must know metal
fabricating, machining and all kinds of welding
processes. Engineering training preferred. Requires energetic person with leadership ability
and cost consciousness. Employes 150 shopmen.
Unusual opportunity—salary open. Send resume
to Box 713, STEEL, Penton Bldg., Cleveland
13, Ohio.

ASSISTANT TO FACTORY SUPERINTENDENT Experienced in general machine practice and press shop. Knowledge in foundry operations desirable but not necessary. Lancaster, Penna. Send resume, availability and salary desired to Box 715, STEEL, Penton Bldg., Cleveland 13,

Positions Wanted

PLANT MANAGER

M.I.T. Engineering Graduate with 20 years experience in plant operations and control. Available immediately. Write Box 712, STEEL, Penton Bldg., Cleveland 13, Ohio.

FOR CLASSIFIED RATES
And Further information write
STEEL, Penton Bldg., Cleveland 13, 0.

STRUCTURAL STEEL **DESIGNERS & ESTIMATORS**

Wanted immediately. Must be experienced and have good personality. Opportunity to be branch office manager. Prefer man in

This leading Southern company has plants located in six cities.

Please send complete resume to Box 714, STEEL, Penton Bldg., Cleveland 13, Ohio. Replies will be held in confidence. Interviews arranged with qualified applicants.

CASTING SALES

Well established steel foundry requires a man. 35 to 50, familiar with castings, preferably with some technical and/or operating experience, for a sales position which will challenge his abilities to apply product application and development through sales media. Previous sales experience is necessary. Remuneration commensurate with experience to include basic salary plus commission and expenses. Resume of experience should be included in reply Location Northeastern United States.

Box 711, STEEL

Penton Bldg.

Cleveland 13, Ohio



MOTORS - GENERATORS TRANSFORMERS NEW . REBUILT

ELECTRIC EQUIPMENT CO.



WORLD'S LARGEST INVENTORY CALL COLLECT GL 3-6783 O. BOX 51 . ROCHESTER I, N. Y



Here's a job that calls for rugged power and dependable gearing — pulling fourteen 75-ton railroad cars along a straight track, up a 1% grade, at a speed of 40 ft. per minute.

Webster Manufacturing, Inc., Tiffin, Ohio, easily solved this problem with the construction of a 50 HP Webster Car Mover. As part of this unit, Webster selected a Horsburgh & Scott Helical Gear Speed Reducer because it provided the necessary stamina for this high-torque job . . . unusually heavy bearings to withstand the greater overhung loads incident to car-puller operation.

From the same source — Horsburgh & Scott — Webster obtains the necessary extra heavy machine cut spur gears that drive the cable drum.

Seventy years of experience prove that rugged construction and ample overload capacity of H & S products assure trouble-free service and operating economy. Send us your requirements or contact your nearby H & S representative for prompt recommendations.



THE HORSBURGH & SCOTT

GEARS AND SPEED REDUCERS

5112 Hamilton Avenue Cleveland 14, Ohio

Advertising Index

Aeroquip Corporation	11
Ajax Engineering Corporation	,
Cable	2:
American Brass Co., The	21
American Optical Co., Safety Products Division Apex Machine & Tool Co., The Aronson Machine Co	111
Associated Spring Corporation	
Babcock & Wilcox Co., The, Refractories Division	11:
Baldwin-Lima-Hamilton Corporation, Hamilton Division	
Associated Spring Corporation Barnes, Wallace, Division, Associated Spring Corporation Barnes, Wallace, Steel Division, Associated	
Spring Corporation Bay State Abrasive Products Co. Behr-Manning Co., A Division of Norton Co.	
Bethlehem Steel Co	
Division Bliss, E. W., Co., Mackintosh-Hemphill Division Borg-Warner Corporation, Ingersoll Steel	3 71
Division	20
Brown & Sharpe Mfg. Co., Machine Tool Division	141
Carlson, G. O., Inc	
Carpenter Steel Co., The	2) man (2)
Colorado Fuel & Iron Corporation, The 44, 144, Columbia-Geneva Steel Division, United States Steet Corporation	24
Cooper-Bessemer	181
Detroit Steel Corporation Dunbar Brothers Division, Associated Spring Corporation Duraloy Co., The	12
Dykem Co., The	743
Electric Equipment Co	2© 1d
Electro Metallurgical Co., A Division of Union Carbide Corporation	1.0
Equipto, Slotted Angle Division	19
Federal Bearings Co., Inc., The	1
Fellows Gear Shaper Co., The Formed Steel Tube Institute	16
Garlock Packing Co., The	5 18
General American Transportation Corporation, Parker-Kalon Division	16
General Electric Co., Metallurgical Products Department	113

neral Motors Corporation, Saginaw Steering	
Gear Division	40
neral Refractories Co	59
son Division, Associated Spring Corporation	22
sholt Machine Co	53
milton Division, Baldwin-Lima-Hamilton	
Corporation	35
milton Foundry & Machine Co., The	162
rnischfeger Corporation	68
rrington & King Perforating Co., Inc., The.	197
sall, John, Inc	105
over Ball & Bearing Co	169
rsburgh & Scott Co., The	206
ugh, Frank G., Co., The	10
jersoll Steel Division, Borg-Warner	
Corporation	57
nes & Lamson Machine Co	170
nes & Laughlin Steel Corporation	101
nes & Laughlin Steel Corporation, Stainless & Strip Division	176
iser Engineers Division of Henry J. Kaiser	64
ystone Steel & Wire Co	69
k & Blum Mfg. Co., The	156
ppers Co., Inc., Engineering & Construction	
Division	139
mson & Sessions Co., The	2
ndis Machine Co	8
ndis Tool Co	13
Blond, R. K., Machine Tool Co., The	4
eds & Northrup Co	38
vinson Steel Co., The	47
ly, Eli, & Co., Agricultural & Industrial Products Division30	, 31
icoln Electric Co., The	48
Idberg Engineering Co	
ide Co., Division of Union Carbide	
Corporation	80
tell, F. J., Machine Co	161
dge & Shipley Co., The	54 199
rd Baltimore Hotel	
ria Brothers & Co., Inc.	201
ackintosh-Hemphill Division of E. W. Bliss	177
Co	17
Spring Corporation	22
stal Treating Institute	182
etallurgical Products Department of General Electric Co.	
	118
cromatic Hone Corporation154,	155
iller Electric Manufacturing Co., Inc.	180
Ilwaukee Division, Associated Spring Corporation	22
innesota Mining & Manufacturing Co	137
organ Construction Co	117
The state of the s	
agara Blower Co	16
orton Co	45
orton Co., Behr-Manning Co. Division	62
hio Crankshaft Co., The	3
nio Division, Associated Spring Corporation	22
sborn Manufacturing Co., The	23
Commention	147
	. 7/
rker-Kalon Division, General American Transportation Corporation	56

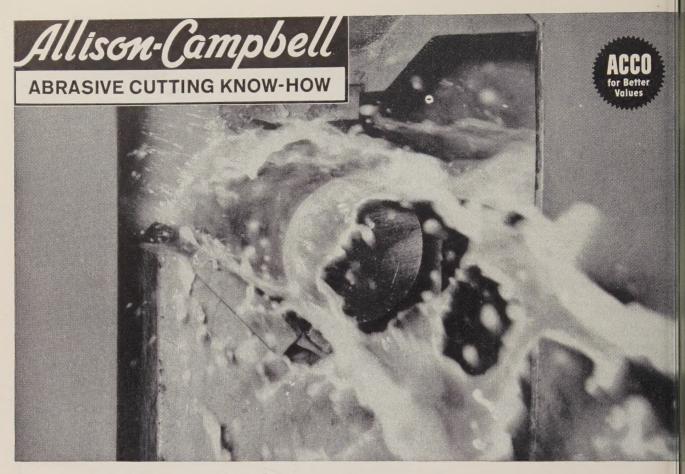
	Partlow Corporation, The 106
	Philadelphia Gear Corporation
	Pittsburgh Steel Co
	Pollock, William B., Co., The
	Raymond Manufacturing Division, Associated
	Spring Corporation 22 Ready-Power Co., The 124
	Republic Steel Corporation14, 15
	Revnolds Metals Co
	Roebling's, John A., Sons Corporation, A Subsidiary of The Colorado Fuel & Iron
i	Subsidiary of The Colorado Fuel & Iron Corporation
	Rollway Bearing Co., Inc
,	Royal McBee Corporation, Data Processing
	Division
'	Ryerson, Joseph T., & Son, Inc
,	Saginaw Steering Gear Division, General Motors Corporation
	Sandvik Steel, Inc
	Sciaky Bros., Inc
	Seaboard Pacific Division, Associated Spring
)	Corporation
	Series corporation of Autorities
	Signode Steel Strapping Co
	Strom Steel Ball Co
	Stromberg-Carlson, Electronic Control Systems
	Division
	Superior Steel Division of Copperweld Steel Co. 125
	Tennessee Coal & Iron Division, United States
	Steel Corporation
,	Textile Machine Works, Contract Division 197
	Thomas Machine Manufacturing Co 185
	Thomson, Judson L., Mfg. Co 168
2	Timken Roller Bearing Co., TheBack Cover
3	Townsend Co. 172 Treadwell Engineering Co. 102
	Treddwell Engineering Co
3	
,	Union Carbide Corporation, Electro
	Metallurgical Division
	Union Carbide Corporation, Linde Division 80
,	
=	United Engineering & Foundry Co 71
3	United Engineering & Foundry Co 71 United States Rubber Co., Mechanical Goods
3	United Engineering & Foundry Co
3	United Engineering & Foundry Co. 71 United States Rubber Co., Mechanical Goods Division 135 United States Steel Corporation, Subsidiaries
	United Engineering & Foundry Co. 71 United States Rubber Co., Mechanical Goods Division 135 United States Steel Corporation, Subsidiaries
	United Engineering & Foundry Co. 71 United States Rubber Co., Mechanical Goods Division
	United Engineering & Foundry Co. 71 United States Rubber Co., Mechanical Goods Division 135 United States Steel Corporation, Subsidiaries
	United Engineering & Foundry Co. 71 United States Rubber Co., Mechanical Goods Division
	United Engineering & Foundry Co
	United Engineering & Foundry Co. 71 United States Rubber Co., Mechanical Goods Division
	United Engineering & Foundry Co. 71 United States Rubber Co., Mechanical Goods Division
	United Engineering & Foundry Co. 71 United States Rubber Co., Mechanical Goods Division 135 United States Steel Corporation, Subsidiaries 37, 49, 50, 51, 52, 120, 121 United States Steel Export Co. 37, 49, 50, 51 United States Steel Supply Division, United States Steel Corporation 49 Universal Atlas Cement Division, United States Steel Corporation 52 Universal Cyclops Steel Corporation 39
	United Engineering & Foundry Co. 71 United States Rubber Co., Mechanical Goods Division 135 United States Steel Corporation, Subsidiaries 37, 49, 50, 51, 52, 120, 121 United States Steel Export Co. 37, 49, 50, 51 United States Steel Supply Division, United States Steel Corporation 49 Universal Atlas Cement Division, United States Steel Corporation 52 Universal Cyclops Steel Corporation 39
	United Engineering & Foundry Co. 71 United States Rubber Co., Mechanical Goods Division 135 United States Steel Corporation, Subsidiaries 37, 49, 50, 51, 52, 120, 121 United States Steel Export Co. 37, 49, 50, 51 United States Steel Supply Division, United States Steel Corporation 49 Universal Atlas Cement Division, United States Steel Corporation 52 Universal Cyclops Steel Corporation 39
	United Engineering & Foundry Co. 71 United States Rubber Co., Mechanical Goods Division 135 United States Steel Corporation, Subsidiaries 37, 49, 50, 51, 52, 120, 121 United States Steel Export Co. 37, 49, 50, 51 United States Steel Supply Division, United States Steel Corporation 49 Universal Atlas Cement Division, United States Steel Corporation 52 Universal Cyclops Steel Corporation 39 Vanadium Corporation of America 152 Virginia Gear & Machine Corporation 72 Wales Strippit Co. 122
	United Engineering & Foundry Co. 71 United States Rubber Co., Mechanical Goods Division
	United Engineering & Foundry Co. 71 United States Rubber Co., Mechanical Goods Division
	United Engineering & Foundry Co. 71 United States Rubber Co., Mechanical Goods Division
	United Engineering & Foundry Co
	United Engineering & Foundry Co. 71 United States Rubber Co., Mechanical Goods Division
	United Engineering & Foundry Co
	United Engineering & Foundry Co
	United Engineering & Foundry Co. 71 United States Rubber Co., Mechanical Goods Division 135 United States Steel Corporation, Subsidiaries 37, 49, 50, 51, 52, 120, 121 United States Steel Export Co. 37, 49, 50, 51 United States Steel Export Co. 37, 49, 50, 51 United States Steel Supply Division, United States Steel Corporation 49 Universal Atlas Cement Division, United States Steel Corporation 52 Universal Cyclops Steel Corporation 39 Vanadium Corporation of America 152 Virginia Gear & Machine Corporation 72 Wales Strippit Co. 122 Wallingford Steel Co., The 171 Ward Steel Co. 199 Washburn Wire Co. 58 Washington Steel Corporation 181 West Penn Power Co., Area Development Department 24 Westinghouse Electric Corporation 175 Wheelock, Lovejoy & Co., Inc. 116 Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 144, 145 Yoder Co., The 6 Youngstown Sheet & Tube Co., The 41
	United Engineering & Foundry Co. 71 United States Rubber Co., Mechanical Goods Division 135 United States Steel Corporation, Subsidiaries 37, 49, 50, 51, 52, 120, 121 United States Steel Export Co. 37, 49, 50, 51 United States Steel Export Co. 37, 49, 50, 51 United States Steel Supply Division, United States Steel Corporation 49 Universal Atlas Cement Division, United States Steel Corporation 52 Universal Cyclops Steel Corporation 39 Vanadium Corporation of America 152 Virginia Gear & Machine Corporation 72 Wales Strippit Co. 122 Wallingford Steel Co., The 171 Ward Steel Co. 199 Washburn Wire Co. 58 Washington Steel Corporation 181 West Penn Power Co., Area Development Department 24 Westinghouse Electric Corporation 175 Wheelock, Lovejoy & Co., Inc. 116 Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 144, 145 Yoder Co., The 6 Youngstown Sheet & Tube Co., The 41

Classified Advertising, Page 205

TO FIND THE MAN YOU NEED...

Place an advertisement in the "Help Wanted" columns of STEEL's classified pages. Your advertisement will reach the qualified men you need, because STEEL is addressed to highly-trained men in all phases of metalworking





Proper Use of Coolant Means Better Abrasive Cutting

• Wet abrasive cutting eliminates burning, minimizes burr, and gives a finer finish than any other cutoff method—and the key to this quality is proper coolant application. Here are the three essentials of adequate cooling:

1. Volume of coolant, rather than pressure, must be kept at a high



Radial holes in ALLISON wheels carry coolant deep *inside* the cut itself. This extra cooling action assures clean cuts and maximum wheel life on solids from 2" to 12" round or square. These holes also impart a self-dressing action to the wheel, keeping sharp grits exposed for cool, fast cutting.

level for maximum wheel life.

2. Coolant must be accurately directed to the *point of contact* between the wheel and the work, because this is the point at which most heat is generated.

3. Coolant must be applied equally to both sides of the wheel to avoid crooked cuts and wheel breakage.

Allison-Campbell Design Assures Proper Cooling

High volume of coolant is provided by a large reservoir and an extracapacity coolant pump.

Good distribution of coolant is assured by a coolant distributor, standard on all CAMPBELL machines. This can be adjusted and locked in position to provide equal distribution of coolant to both sides of the wheel and to the work.

High-speed, quality cuts on almost any material are possible with modern abrasive cutting tech-

niques. Your Allison-Campbell Field Engineer will be glad to recommend the right machine and wheels for *your* cut-off jobs. Call on him for help.

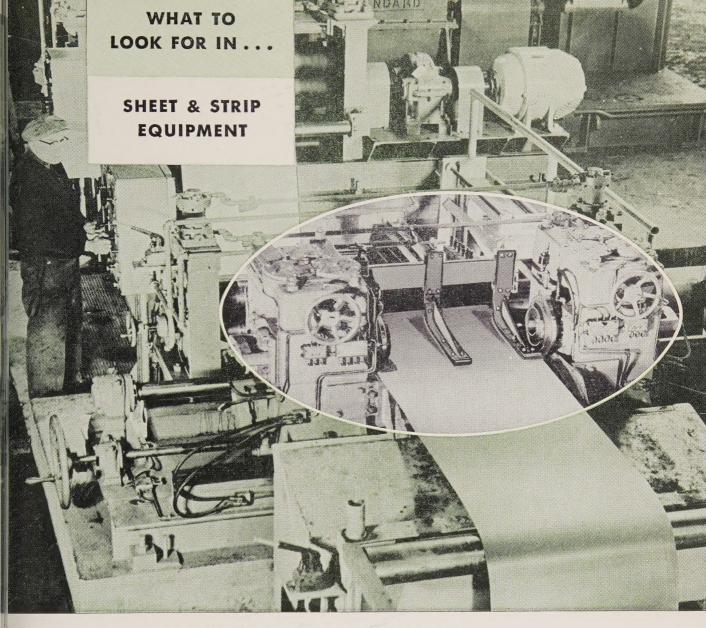
A complete selection of machines and wheels for any cut-off application is offered by Allison-Campbell. Four types of Campbell machines—chop stroke, oscillating, horizontal, and rotary—in capacities from the smallest stock to 14" rounds... billets up to 12" square... plate up to 6" thick and 20 ft. long. Allison wheels—more than 150 different specifications—rubber or resinoid bond—3" to 34" diameters—.006" to 3/16" thick.

Write for a copy of DH-20, a new bulletin describing the Allison-CAMPBELL Demonstration Laboratory, and how you can take advantage of the special services it offers. Complete details on Allison wheels and CAMPBELL machines are also available.

ALLISON-CAMPBELL DIVISION AMERICAN CHAIN & CABLE

921 Connecticut Avenue, Bridgeport 2, Conn.





there's a DIFFERENCE in SLITTERS...

Easy Adjustment

Each top spindle arranged for vertical adjustment.

Each spindle can be accurately set by screw adjustment for knife-side clearance.

Micrometer adjustment by worm and gear reduction in setting the vertical knife clearance.

Housings can be adjusted for various widths of strip.

Positive right-angle alignment of the rotary knives with strip. Handwheel adjustment for upper chuck located where operator can see knife clearance.

Easy Operation

All spindles driven by single helical gears of heat-treated alloy steel.

On many sizes, housings of high-speed tin-plate side trimmers tilted to assure side scrap removal from strip, preventing scrap cobbles.

Maintenance

Bearings serviced by centralized lubrication.

Improved oil seal arrangement provided for trimmer housings.

Good Construction

All internal parts housed in two cast-steel housings with oil seals to retain bearing lubricant.

Knives of high-carbon, high-chrome forged steel of double-edge reversible type.

Spindle housings and drive carried on heavy welded structural steel base.

Two-point support included for each upper chuck.

Mill-type shoe design assures proper alignment of housings for trimmer.

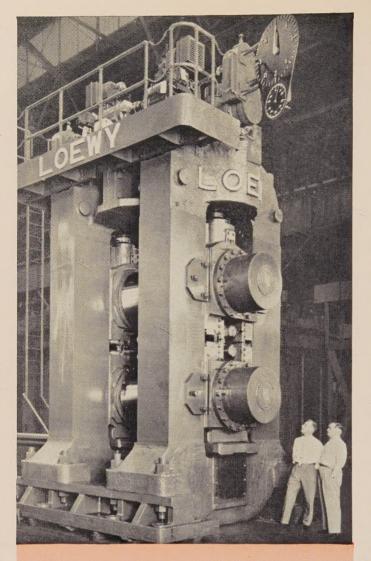
Four driven spindles of alloy steel forgings carried in two double rows of anti-friction bearings.

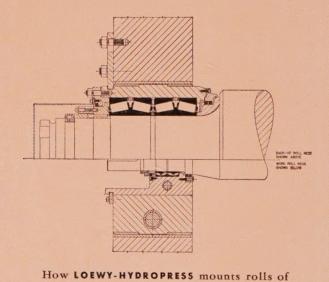
AFTNA · STANDARD

HE AETNA-STANDARD ENGINEERING COMPANY

GENERAL OFFICES: PITTSBURGH, PA. . PLANTS: ELLWOOD CITY, PA., WARREN, OHIO . PROCESS LABORATORY: AKRON, OHIO

OTHER COLD DRAW FOLLIPMENT . ROLLS AND CASTINGS . EXTRUDERS, MILLS, PRESSES FOR RUBBER AND PLASTIC





this 12 x 43 x 42 mill on Timken bearings to take shocks, assure longest, most economical life.

Rolls up to 20" x 20" the "hard" way... Timken® bearings take the shock

THIS powerful 4 Hi reversing mill, built by Loe Hydropress Division of Baldwin-Lima-Hamili Corp., is doing its job the "hard" way—rolling so slab ingots of special hard alloys up to 20" x 20"? roll them down to .010" or less takes a lot of for It's hard work. This mill operates at a separate force of 140,000 lb. per inch of width—at spectrom 75 to 200 fpm. To take the heavy shocks, kl bearing cost down, Timken® tapered roller bearing used to mount the back-up and work rosscrewdown drive and screwdown worm go 24 Timken bearings all told.

Here are the big reasons why 1008 steel mills. Timken tapered roller bearings on roll necks:

1. Longer life. Tonnage records show that long life of Timken roll neck bearings keeps bear cost per ton of steel rolled at rock bottom. 2. Betwill rigidity. Balanced proportion design of Timbearings permits larger roll necks than ever between possible with tapered roller bearings. Load rationare increased up to 40% due to Timken bearing balanced proportion design. 3. Simplified lubrication No complicated systems; Timken bearings per use of simple grease lubrication. 4. No special the bearings needed. Timken bearings take both rad and thrust loads. 5. Steel loss ended in mill stops starts. Timken bearings permit starting under loads. 6. Faster mill rolling speeds because Timbbearings minimize friction.

Timken bearings make any machine better. A better machines make better products. That's Bettness. And the trade-mark "TIMKEN" is your sy bol of Better-ness. Look for it. The Timken Ro Bearing Company, Canton 6, Ohio. Canadian pla St. Thomas, Ontario. Cable address: "TIMROSC





BETTER-ness rolls on TIME tapered roller bearing